Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

Web Appendix to: The Global Burden of Cancer 2013

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1 DATA SOURCES

1.1 CANCER INCIDENCE DATA SOURCES

Data was sought on cancer incidence broken down by age, sex, year, primary cancer site, and location. A large cancer incidence dataset was created through a combination of individual cancer registry data, literature reviews, the use of the "Cancer Incidence In Five Continents" (CI5) database[1–10], and the pursuit of data from specific additional countries. CI5 comprised 53% if the incidence data used. In addition to CI5 data, published and grey literature was searched. Search terms were a combination of "cancer registry" and the country name or region (e.g., cancer registry Angola; cancer registry Caribbean). Publications were excluded if they contained data not representative of the coverage population, if they were clinical trials, if they did not contain at least incidence data tabulated by cancer site and sex, if the data were limited to years prior to 1980, if the source did not provide details on the population covered or if the list of cancer sites included was not comprehensive. Additional eligible sources were identified and incorporated via the GLOBOCAN 2008 Project.[11] NORDCAN data for Norway, Finland, Sweden, Iceland, and Denmark through 2012 was also incorporated as available.[12] Countries on the IACR membership list that were not included in the CI5 datasets were targeted for data collection.[13] Data reported on the IACR[13], GLOBOCAN[11], and The African Cancer Registry Network (AFCRN)[14] websites were reviewed to find more registries to contact or consult online. In addition to these sources, additional data were identified that fit the inclusion criteria from sources already in the Institute for Health Metrics and Evaluation's (IHME) Global Health Data Exchange (GHDx) database[15], such as statistical yearbooks, which had initially been downloaded for other purposes. The most recent data available for any data source until 2012 was used. A list of the cancer registries included in our analysis and the years covered can be found in eTable1.

1.2 MORTALITY/INCIDENCE RATIO DATA SOURCES

To generate Mortality/Incidence (MI) ratios at the registry level, cancer incidence and mortality data were extracted from cancer registries if both were reported. eTable 1 shows those registries, that were used as MI ratio data sources. Additional MI ratios were added from the CI5 database.[1–10]

1.3 CANCER DEATHS DATA SOURCES

The methods used to generate the Cause of Death (CoD) database are reported in detail elsewhere.[16] Briefly, the goal was to identify all published and unpublished data relevant to estimating CoD for 188 countries from 1980 to 2013. In addition to the mortality estimates from cancer registry data (through MI ratio transformation), sources include vital registration systems, verbal autopsy studies, and other sources not used for cancer mortality estimation (burial and mortuary data, health facility deaths records, police reports, demographic and health surveys, censuses, maternal mortality surveillance systems). Mortality data from cancer registries were not used as sources for the CoD database to avoid using the same data twice. The other rationale is that countries with cancer registries that report mortality data generally have a high quality vital registration system. A list of all sources for the CoD database can be found in Naghavi et. al 2014.[16] eTable 2 shows the number of site years by source for GBD cancer causes.

1.4 CANCER REGISTRY DATA FORMATTING

The original cancer registry data went through multiple formatting steps. First, the original data was transformed into standardized files, which included standardization of variables, registry names, and diagnostic codes.

1.5 MAPPING

The underlying reporting systems differ by the cancer registry and over time with regards to coding system used and level of detail reported. In order to ensure comparability cancer registry data was mapped to one standardized set of causes. All cancer codes were mapped to 28 cancer causes, which include three female specific cancers (cervical, ovarian and uterine cancer) and two male specific cancers (testicular and prostate cancer). The grouping of cancers is based on the International Classification of Diseases (ICD) and includes all ICD codes pertaining to neoplasms (ICD-9 140-239; ICD-10 C00-D49).
eTable 3 shows how the original ICD codes were mapped to the standardized GBD cause list. Undefined causes were mapped to target codes for later redistribution (eTable 4). Benign neoplasms in cancer registry incidence data were mapped to the "Other neoplasms" group. Kaposi sarcoma incidence was not estimated since it was attributed directly to HIV. Non-melanoma skin cancer estimates are not reported in this publication since it is an exception to most other cancers with a very high incidence, which is usually not collected by cancer registries, and low mortality.

1.6 AGE SPLITTING

Data was standardized to a consistent age and sex format. In GBD, metrics are reported by 5-year age groups. Data from CI5, as well as from cancer registries that reported cases by GBD age groups were used as long as they reported yearly cases to calculate the proportion of cases or deaths in each 5-year age group by cancer, country, sex, and period (≤1980, 1980-1994, ≥1995). Then, when wider age groups were reported (e.g. 0-14, 65+), these proportions were used to split the data into these smaller age categories. If coefficients were not available at the country level, proportions from the corresponding GBD region or super-region were used as necessary.

1.7 AGGREGATED CODE

Reporting code in cancer registries is not uniform and can be aggregated or have missing codes. In order to ensure comparability between cancer registries the registry data was standardized, which included separating aggregated codes and identifying missing codes for each registry.

Examples of the aggregated codes included some registries reporting ICD-10 codes C00-C14 cases together as lip, oral cavity, and pharyngeal cancer. These groups were broken down into detailed GBD codes involving lip and oral cavity cancer (C00-C08), nasopharyngeal cancer (C11), and cancer of other parts of the pharynx (C09-C10, C12-C13). A regional standard cancer fraction (number of cancer cases by site divided by the total number of cancer cases) was used based on data from CI5, as well as from other cancer registries to calculate the proportion of each GBD cancer cause as well as the proportion of the undefined cancer (C14). The total number of cases from the aggregated group (C00-C14) was then assigned to the GBD cause subgroups and the undefined code (C14). C14 was then redistributed in the next step.

1.8 REDISTRIBUTION OF UNSPECIFIED SITE CODE

As mentioned above unspecified site codes were marked for later redistribution during the preparative process. These codes were assigned to potential target codes based on an a priori decision about the underlying anatomy and pathophysiology. eTable 4 shows the 11 groups of undefined codes for ICD-10 with the respective target codes. For each of these groups, we defined the "universe" of data as all incidence data coded to either the group's undefined codes or the group's redistribution targets for each country, year, age, and sex. The following regression was then used as described in Ahern et al[17]:

$$TG_{crt} = \alpha + \beta U_{crt} + \gamma_r + \theta_r U_{crt} + \varepsilon_{ct}$$

-TG_{crt}: % of incidence data within a given undefined site code's "universe," which were coded to specific site groups, by country (c), year (t) and with countries categorized into regions (r)

-U_{crt} : % of incidence data within given undefined site code's "universe" coded to undefined site code by country, year, region

-α : fixed constant

-β : slope coefficient describing association between U and TG

-γ_r : region-specific random intercept

-θ_r: region specific random slope

-ε_{ct}: normally-distributed error

If the β coefficient was positive and statistical significant at a $p<0.05$ level, the target group was dropped and the regression rerun. Again, targets were dropped if the β coefficient was positive and statistically significant. The regression was then repeated a third time. After running the regression three times, the y-intercept was used as an estimation of an ideal, all-target, no undefined universe. If there were multiple target groups, the y-intercepts for negative and statistically significant β coefficients were scaled to sum 100% and the proportions for the different target codes were used to redistribute the undefined codes to the target code.

Separate regressions were run for each sex and for the following three age groups within each sex: 0-14, 15-49, 50+. Country-years were grouped into 21 regions (eTable 5).

As an example the process for redistribution of undefined malignant neoplasms of the lip, oral cavity, and pharynx is described: For the undefined codes related to these neoplasms (ICD-9: 149, 149.0, 149.1, 149.8, 149.9 and ICD-10: C14.0-C14.3, C14.9) the a priori specified target codes were 140-148 for ICD-9 and C00, C00.0-C00.6, C00.8, C00.9, C01, C02, C02.0-C02.4, C02.8, C02.9, C03, C03.0, C03.1, C03.9, C04, C04.0, C04.1, C04.8, C04.9, C05, C05.0-C05.2, C05.8, C05.9, C06, C06.0-C06.2, C06.8, C06.9, C07, C07.9, C08, C08.0, C08.1, C08.8, C08.9, C09, C09.0, C09.1, C09.8, C09.9, C10, C10.0-C10.4, C10.8, C10.9, C11, C11.0-C11.3, C11.8, C11.9, C12, C13, C13.0-C13.2, C13.8, C13.9 for ICD-10. The regression model determines the relationship between the (combined) undefined codes and the target codes. The beta value represents the rate of change of the proportion of the target group-attributed incidence data within the lip, oral cavity, and pharynx neoplasm "universe" to the proportion of incidence of undefined

malignant neoplasms of the lip, oral cavity, and pharynx change across country-years. As described in Ahern et al[17] three scenarios can occur with respect to the beta value:

1. **Negative β**: The relative proportion of the target group-attributed incidence data within the undefined lip, oral cavity, and pharynx neoplasm "universe" ***increases*** as the proportion of undefined lip, oral cavity, and pharynx neoplasms decrease. Thus, incidence data due to causes in this target group are being miscoded as undefined incidence data and should be redistributed to the target cause. The more negative the β value, the greater the frequency with which the target is attributed to the undefined malignant neoplasms of the lip, oral cavity, and pharynx.
2. **β ~ 0**: The relative proportion of the target group-attributed incidence data ***do not change*** as the proportion of lip, oral cavity, and pharynx neoplasm-attributed incidence data change. Thus, causes in this target group are not being miscoded to undefined malignant neoplasms of the lip, oral cavity, and pharynx and should not be a target for redistribution.
3. **Positive β**: The relative proportion of the target group-attributed incidence data ***decreases*** as the proportion of undefined lip, oral cavity, and pharynx neoplasm incidence data decreases. Thus, this target is not being miscoded to undefined malignant neoplasms of the lip, oral cavity, and pharynx and should not be a target for redistribution.

eTable 7 shows the results for the regression model for undefined code "malignant neoplasms of lip, oral cavity, and pharynx", by age group and region and also shows the regional fractions of the target codes.

2 MORTALITY TO INCIDENCE RATIO ESTIMATION

In order to supplement the GBD cause of death data from vital registration systems and other sources MI ratios are being used to transform incidence data to mortality estimates. To generate MI ratios for the GBD cancer causes the first step was to calculate MI ratios for registries that report both incidence and mortality data or use the MI ratios that were directly reported in the registry data (e.g. CI5 MI ratios). Since not all registries provide MI ratios by age, aggregated MI ratios were separated into age-specific ratios. Using all data available by age, the MI ratio in each group was estimated by dividing total deaths by the total number of cases across all registry-years. These average age-specific MI ratios were converted to relative MI ratios for each age group compared to an index group of ages 60-64. These relative patterns by age were used to generate approximate MI ratios by age using the following equation:

$$MI\ ratio_{\ a,c} = \frac{\sum RL_a * n_{a,c}}{D_c} * RL_{a,c}$$

RL=Relative level of MI ratio; a=age group; n=number of cases in the registry or country; c=country or registry; D=total deaths reported for all ages

The age-specific MI ratios were then used to model MI ratios for all countries by sex and year as described by Forouzanfar et al.[18] This was done in a three step analysis including:

1. A linear step using lag distributed income per capita (I$) (LDI - gross domestic product per capita that has been smoothed over the preceding 10 years) to predict the level of MI ratio for each country, sex, and year:

$$Ln\left(MI\ ratio_{c,a,y}\right) = \beta_0 + \beta_1 LDI_{cy} + \beta_a + \gamma_c + \vartheta_y + \epsilon_{c,a,y}$$

$$\gamma_c \sim N\left(0, \sigma_\gamma^2\right) \qquad \vartheta_y \sim N(0, \sigma_\vartheta^2) \qquad \epsilon_{c,a,y} \sim N(0, \sigma_\epsilon^2)$$

c=country; *a*=age group; *y*=year; β_a=fixed effect by age.

The model assumes that the country and year random effects are uncorrelated.

2. An analysis of the residuals allowed for identification and exclusion of outliers. The algorithm used to identify outliers is depicted in eFigure 3.
3. The rationale for excluding outliers is that unexpectedly low MI ratios in countries with known limited access to healthcare are most likely related to incomplete follow up rather than better survival.[8] All data of a country were dropped if the country random effect was smaller than the U.S. random effect. If LDI had a positive correlation with MI ratio, it was dropped from the model. If the MI ratio had an increasing or unacceptable trend from 1980 to 2010, a model without year as covariate was applied. If the MI ratio estimate of a developing country was smaller than the U.S. MI ratio estimate, it was replaced with the U.S. estimate.

4. Finally, the estimated age-sex-year-country specific MI ratios were applied to all available incidence data to generate estimates of mortality by age, sex and year. These estimates were added to the CoD database for use in the mortality estimation step.

3 CAUSE OF DEATH DATABASE FORMATTING

Cancer mortality data is part of the GBD CoD database. General formatting is described in Naghavi et al.[16] For cancer mortality the same map was used for both mortality and incidence data (eTable 4) with the exception that all deaths coded as carcinoma in situ, neoplasm of uncertain behavior and benign neoplasms were mapped to their respective malignant counterpart under the assumption that these deaths were miscoded to the non-invasive neoplasm when in fact the person died of the invasive cancer. eTable 8 lists the carcinoma in situ, neoplasm of uncertain behavior, and benign neoplasms assigned to the respective cancers and eTable 9 shows by what percentage the mortality estimates increased for each GBD cancer category after assignment benign, in situ, and neoplasms of uncertain behavior to the invasive cancer.
For garbage code redistribution the same method was used for mortality data as described for incidence data. There are many different types of reallocation codes. For the purpose of illustration we define garbage codes in the mortality data in four groups:

1. General ill-defined codes, which have to be redistributed to all causes of death including cancer (for example in ICD-10 code R99: "Ill-defined and unknown cause of mortality").
2. Intermediate causes like "death due to renal failure", which also have to be redistributed to specific target codes.
3. Deaths that are assigned to symptoms like "gastrointestinal bleeding", which will be redistributed to causes related to the specific organ system including cancer (e.g. target codes for gastrointestinal bleeding would include peptic ulcer disease, liver disease, liver cancer, stomach cancer etc.).
4. Unspecified cancer sites (e.g. C80: "Malignant neoplasm without specification of site", C55: "Malignant neoplasm of uterus, part unspecified", etc).

After defining target codes separate regression models were run for each sex and for the following three age groups within each sex: 0-14, 15-49, 50+. Country-years were grouped into the 21 GBD regions.

eTable 10 and eFigure 2 give an example of the percentage increase for the 2008 cancer specific mortality estimates after redistribution of garbage code from all countries using ICD-10 in 2008.
An exception to the above mentioned system was Kaposi sarcoma, (KS) which is mainly a consequence of Acquired Immunodeficiency Syndrome (AIDS). It was therefore considered as a sequela of HIV infection and 95% of KS deaths were classified as HIV deaths. The remaining 5% were assigned to "Other neoplasms".
Based on the childhood cancer classification system[19], the lower age limit was restricted to age 15 for all cancers except cancer of the pharynx, liver, kidney, brain and nervous system, thyroid, Hodgkin lymphoma, non-Hodgkin lymphoma, leukemia, and other malignant and benign neoplasms. Cases or deaths reported for ages below 15 for cancers not considered childhood cancers were assigned to the "Other neoplasms" group.

3.1 CHOICE OF COVARIATES

It is important to emphasize that **covariates** and **risk factors** are two separate concepts in the GBD framework. As part of GBD a comparative risk assessment is being done, which assesses the fraction of a disease that can be attributed to a certain **risk factor**. However, in this publication results for the risk factor assessment are not being reported.
Covariates are used to help with mortality estimation in areas with sparse data. As each specific cancer has a unique set of causes and related factors, mortality estimates for each cancer were produced with a unique set of covariates. It is important to mention that the inclusion of covariates into the models is for *descriptive* purpose and does not require that there is an unequivocally proven causal relationship between the outcome and the covariate. Due to the lack of data in most countries certain covariates that would be useful in cancer (e.g. for breast cancer risk genetic risk factors like BRCA 1/2 prevalence in the population, age at menarche, breast feeding patterns, etc.) were not included. eTable 11 lists the covariates selected for each cancer group. Two covariates, income per capita and years of education per capita, were used in all cancer models because of the established link between higher income and increased education and reduced cancer mortality.[20–23] The 'level' column indicates the hypothesized strength of the evidence. As described in Foreman et al[24] covariates with strong proximal relationships, such as etiological or biological roles in the disease process, are ranked as level 1. Covariates for which there is strong evidence for a relationship, but not a direct biological link, are placed in level 2. Covariates with weak evidence for a relationship, or which would be distal in the causal chain and thus may be mediated by factors in levels 1 or 2, are categorized as level 3. Based on the literature, we assign the direction for each covariate a priory. The following sections lists the rationale behind the selection of covariates for each GBD cancer group.

3.1.1 Esophageal cancer

Alcohol consumption has been shown to be associated with esophageal cancer.[25,26,27] Smokers had an odds ratio of 2.3 for distal esophageal cancer compared to non-smokers. Other studies have also found that smokers have a higher risk of esophageal cancer.[26,28,29,30] Low consumption of fruits and vegetables and high consumption of meat have been associated with higher risk of all cancers.[26,27,31,32] Higher body mass index (BMI) is associated with risk of esophageal cancer[26,33] Drinking water from a source other than tap water, along with poor sanitation, was associated with an increased risk of esophageal cancer in a case-control study in Linzhou City, China.[33] Expert opinion advised that both indoor and outdoor pollution could be associated with risk of esophageal cancer.

3.1.2 Stomach cancer

Multiple smoking covariates were used to account for the increased risk of stomach cancer that exits from previous smoking. Multiple studies in regions with high levels of stomach cancer have shown a small, but significant increased risk for stomach cancer among smokers.[34] Evidence also suggests that exposure to indoor and outdoor air pollution is associated with increased stomach cancer mortality.[35] Alcohol and red meat covariates were included because of the evidence linking increased red meat and alcohol consumption with stomach cancer, and fruit and vegetable covariates were included because of the apparent protective effect of high fruit and vegetable consumption on stomach cancer.[25,36,37] Water and sanitation covariates were also included because exposure to food and water-borne pathogens, particularly H. pylori, has been shown to significantly increase incidence of stomach cancers.[38,39]

3.1.3 Liver cancer

Alcohol intake has been linked to hepatocellular carcinoma (HCC) in many reports, although the threshold dose and duration of use are unclear. The relationship between ethanol and HCC could be a direct toxic effect, or an indirect one, since alcohol represents an important risk factor for cirrhosis, a predisposing factor for HCC.[40,41,42] Chronic infection also results in an increased risk of developing cholangiocarcinoma. The risk appears to be greatest with Opisthorchis viverrini (liver fluke) infections from Northern Thailand, where a 5 to 15-fold increase in infected individuals is described.[43,44] The association between chronic hepatitis B viral infection and HCC has been demonstrated in several studies. In general, HCC can occur without cirrhosis or significant fibrosis in patients with chronic hepatitis B.[45,46] A strong association between chronic hepatitis C virus (HCV) infection and HCC was observed in multiple studies. An important clinical observation is that HCC in patients with HCV occurs almost exclusively in patients with advanced stages of hepatic fibrosis or cirrhosis.[47] Consumption of saturated fat and red meat has been associated with an increased risk of HCC.[48] Epidemiologic studies suggest a possible link between diabetes mellitus and HCC. In addition, a study found that the presence of the metabolic syndrome was a risk factor for HCC (adjusted odds ratio 2.1).[49,50] Adequate health care services increase early detection rates for HCC and improve survival.[51,52] Cigarette smoking has been shown to be a risk factor for HCC in some, but not all studies.[53]

3.1.4 Trachea, bronchus, and lung cancer

Smoking is highly related to risk of lung cancer.[54] Risk of lung cancer is also associated with indoor air pollution, as a study in China found.[55] Similarly, a study of seven countries found that the odds ratio of lung cancer associated with using solid fuel for cooking or heating was 1.37.[56] In a study of men and women in the United States, fruit and vegetable consumption was associated with a decreased risk of lung cancer.[57] This protective effect was also found in a review of studies done about the association between fruit and vegetable consumption and cancer.[58]

3.1.5 Breast cancer

Alcohol consumption is associated with a greater risk for breast cancer.[59] A case-control study found that drinking 10 drinks per week compared to 0 drinks per week as an early adult was associated with an age-adjusted odds ratio of 2.2.[60] A study of post-menopausal women in Iowa found that the relative risk of breast cancer increased as consumption of alcohol increased.[61] An association between consumption of animal fat and increased risk of breast cancer mortality has been found in multiple countries.[62,63,64] Risk of breast cancer increases as BMI increases for post-menopausal women.[65,66] However, for pre-menopausal women, the risk is inverse with a lower risk for breast cancer in the setting of a higher BMI.[67] A study done in North Carolina found that among post-menopausal women who smoked within the past three years, the odds ratio of breast cancer was 3.4, and for post-menopausal women who smoked 4-9 years ago, the odds ratio was 3.0.[68] In a study done in Italy, former smokers who stopped 3 or less years ago had an odds ratio of 1.45 for breast cancer compared with never smokers, and those who stopped 3-6 years ago had an odds ratio of 1.79 compared with never smokers.[69] Childbearing is associated with a lower risk of breast cancer, with greater decrease associated with early first birth and larger number of births.[70] In a study of all breast cancer cases in Singapore from 1968 to 2002, the total fertility rate (TFR) was inversely associated with breast cancer incidence.[71] The decision to include a covariate for health system access was based on expert opinion. Breast cancer death rates rise with distance from the equator.[72,73] A meta-analysis of studies on diet's effect on breast cancer risk found that both vegetables and fruits were protective.[74]

3.1.6 Cervical cancer

An association was found between smoking and risk of cervical cancer; the relative risk for current smokers compared with non-smokers in a study done in Norway was 1.5.[75] Other studies have also found a similar association.[76] The risk of cancer decreased with increasing parity as well as increasing age at first and last birth.[77] A study of developing countries found that high fertility rates and early age at birth of first child are associated with higher cervical cancer rates.[78] In a Ugandan study, those with Human Immunodeficiency Virus (HIV) had an increased risk of cervical cancer (standardized incidence ratio of 2.4).[79] The decision to include health system access, as well as TFR and HIV prevalence (antiretroviral (ARV) adjusted), as covariates was based on expert opinion. A meta-analysis found that vegetable and fruit consumption was associated with decreased risk of cervical cancer.[80]

3.1.7 Uterine cancer

While the data linking smoking with an increased risk of uterine cancer are sparse, multiple smoking covariates were included in the models because of the positive association between smoking and cancer in many other sites and the possibility of a similar relationship here. Covariates estimating the diabetes prevalence and mean BMI were included in these models because of the established links between diabetes and obesity and increased incidence of uterine cancer.[81,82] Fruit and vegetable covariates were included because of the apparent protective effect of high fruit and vegetable consumption on uterine cancer.[81,82] TFR was included as a covariate because of the expert opinion that there may be a link between fertility and uterine cancer;[77] however, a direction was not specified for this covariate because current studies are inconclusive on the nature of the relationship.

3.1.8 Prostate cancer

Adequate health care services allow for early detection of prostate cancer and therefore improve survival. A diet high in animal fat may be an important factor in the development of prostate cancer.[83] This is particular to diets that include red meat and some dairy products as intake of large amounts of alpha-linoleic acid and low amounts of linoleic acid appear to increase risk of prostate cancer; this combination is common in red meat.[84] Multiple prospective cohort and case control studies have given conflicting results about the association between the incidence of prostate cancer and obesity as assessed by BMI. A large meta-analysis showed a statistically significant increase in prostate cancer with increasing BMI (relative risk 1.06 for each 5 kg/m2).[85] A positive association is seen between smoking and fatal prostate cancer.[86] A diet low in vegetables may be another risk factor for prostate cancer.[87] In the prospective Prostate Cancer Prevention Trial, among consuming ≥50 g/day of alcohol increased the relative risk of high-grade prostate cancer to 2.0 (95% CI 1.3-3.1).[88]

3.1.9 Colon and rectum cancer

Cigarette smoking has been associated with increased incidence and mortality from colorectal cancer (CRC). A meta-analysis of multiple observational studies estimated that the risk of developing CRC was increased among cigarette smokers compared to those who never smoked (relative risk 1.18, 95% CI 1.11-1.25) and the risk of dying from CRC was also increased among smokers (RR 1.25, 95% CI 1.14-1.37).[89] Nut and seeds rich in fiber have been shown to have antineoplastic properties.[90] Long-term consumption of red meat or processed meats may be associated with an increased risk of CRC, particularly left sided tumors.[91] A number of studies have identified a role for dietary fiber in the pathogenesis of CRC. However, this protective effect on the development of adenomas has been challenged by one large randomized control trial.[90] An association between alcohol consumption and an increased risk of CRC has been observed in several studies particularly in those whose alcohol consumption exceeded 45 g/d (adjusted relative risk 1.41, 95% CI 1.16-1.72).[92] Increasing evidence suggests that diabetes mellitus is associated with an elevated risk of CRC. A meta-analysis estimated that the risk of CRC among diabetics was approximately 30 percent higher than non-diabetics (RR 1.30, 95% CI 1.20-1.40).[93] Many epidemiologic studies have shown an association between the intake of a diet high in fruits and vegetables and protection from colorectal cancer.[94,95] Two large prospective cohort studies have shown that being obese confers an approximately 1.5-fold increased risk of developing CRC relative to being normal weight.[96,97]

3.1.10 Lip and oral cavity cancer

Oral cavity cancer is associated with alcohol consumption. In a case-control study in Madrid, the odds ratio for drinking 50 g/day of alcohol compared with none is 5.3.[98] In a Swedish study, those who drank alcohol had an increased risk of oral cavity cancer: the odds ratio for beer drinkers was 1.9; for wine, it was 1.3; and for liquor, it was 1.6.[99] A study done in Taiwan found that smoking and alcohol both increased the risk of oral cavity cancer.[100] In the Madrid case-control study, the odds ratio of 6-20 cigarettes/day is lower than for more than 20 cigarettes/day, both compared with no cigarettes per day: the odds ratios are 3.1 and 7.96, respectively.[98] In a Swedish study, the odds ratio for oral cavity cancer was 1.8 for current smokers compared to never smokers.[99] The health system access covariate was included based on expert opinion that the availability of treatment would reduce the risk of lip and oral cavity cancer. Consumption of red meat is also associated with higher risk for oral cavity cancer.[101]

3.1.11 Nasopharynx cancer

A review of the literature on risk factors associated with pharynx cancer found that consumption of fruits and vegetables is associated with a lower risk of pharynx cancer.[102] Health system access was included as a covariate based on expert opinion. Malnutrition,[103] population density,[104] and whole grains[105] were included as covariates based on their relationship to cancers of other parts of the pharynx.

3.1.12 Cancer of other part of the pharynx and oropharynx

A review of many factors associated with pharynx cancer found studies that suggested that malnutrition predisposes people to this type of cancer.[106] This same review found that smoking and tobacco are associated with higher risk of pharynx cancer. A case-control study conducted in Italy and Switzerland also found that tobacco was a major risk factor.[107] A summary of studies done regarding rural-urban differences in cancer incidence found that as population density increases, pharynx cancer incidence increases as well.[108] In an Italian study, the risk of pharynx cancer was halved for the highest quintile intake of vegetables compared to the lowest quintile of intake, and the risk was almost halved for the highest quintile intake of fruit compared to the lowest.[109] A review of the literature on the association between fruit and vegetable intake and cancer risk found that there is some evidence for a preventive effect of fruits and vegetables for pharynx cancer risk[110] Similarly, high intake of whole grains is associated with reduced risk of pharynx cancer.[111]

3.1.13 Gallbladder and biliary tract cancer

A meta-analysis of alcohol drinking and cancer risk found a pooled relative risk of 1.17 of gallbladder cancer for those who drink 25g per day of alcohol compared to those who do not.[112] Gallbladder cancer risk was found to be positively associated with total calorie intake, with an odds ratio of 4.1 for the highest quintile of calorie intake compared with the lowest in a Polish case-control study.[113] A review finds that high caloric intake is associated with greater risk of gallbladder cancer.[114] A second review of the association between dietary factors and gallbladder cancer found that fruits and vegetable consumption reduce the risk of gallbladder cancer, and that obesity increases the risk.[115] Tobacco chewing and smoking were associated with increased odds of gallbladder cancer in a study of women in India.[116] Other studies have also found that smoking increases the risk of gallbladder cancer.[117,118] Diabetes is also related to increased risk of gallbladder cancer.[117,118,119]

3.1.14 Pancreas cancer

A study of post-menopausal women in Iowa found that the relative risk of pancreatic cancer increased with the amount of alcohol consumed.[120] In a case-control study in Poland, the risk of pancreatic cancer increases with lifetime cigarette consumption.[121] In a case-control study conducted in three states, smokers had a 70% increased risk of pancreas cancer compared to non-smokers, and there was an increasing risk with an increased duration of smoking.[122] Increased consumption of fruits and vegetables was associated with decreased risk of pancreatic cancer in a study of California Seventh-day Adventists,[123] as well as in a meta-analysis review.[37] The odds ratio of pancreatic cancer was 1.6 for those who ate the most red meat compared to those who did not in a study done in Italy.[36] Intake of red meat was associated with a 50% increase in risk of pancreatic cancer in a study done in Hawaii and Los Angeles.[124] That same study also found that fat from meat was related to increases in pancreatic cancer risk. A study that used data from two cohort studies in the US found that individuals with a BMI greater than or equal to 30 kg/m^2 had a relative risk of 1.72 of pancreatic cancer compared to those with a BMI less than 23 kg/m[125,126] Similarly, on an individual level, those who have diabetes are at greater risk of developing pancreatic cancer.[127] Health system access was included in the model based on expert opinion.

3.1.15 Malignant melanoma of skin

We included latitude covariates to attempt to capture the positive association of melanoma and latitude >45° mainly for two reasons: Northern European origin population are at an increased risk due to their light colored phenotype, and population in Australia are at an increased risk due to the disruption of the ozone layer over that part of the globe and therefore reduced ozone filtration of sun UV radiation.[128] We used lagged smoking covariates (cigarettes per capita lag 20, cigarettes per capita lag 10, smoking prevalence lag 20, and cumulative cigarettes lag 20) to account for the increased risk of cancer that exists from previous smoking.[129,130,131] We also tested models with current smoking prevalence to account for the effects of current smoking habits on cancer mortality. Alcohol and animal fat were included because of the evidence linking increased red meat and animal fat and alcohol consumption with many cancers[25], and fruit and vegetable covariates were included because of the apparent protective effect of high fruit and vegetable consumption on cancers.[37,110] Mean BMI and diabetes prevalence covariates were included as proxies for lifestyles that may be lead to higher cancer mortality.[132]

3.1.16 Ovarian cancer

A meta-analysis of alcohol drinking and cancer risk found a pooled relative risk of 1.11 of ovarian cancer for those who drink 25g per day of alcohol compared to those who do not.[112] A second meta-analysis also found that alcohol increases risk of ovarian cancer.[133] Smoking is associated with a higher risk of ovarian cancer; in one study using data from the Cancer and Steroid Hormone Study, the

odds ratio for women who had ever smoked was 2.3 and for current smokers, it was 2.9.[134] A study of 26 to 30 countries found that increased caloric intake was associated with higher risk of ovarian cancer death.[62] A study in Shanghai of dietary impact on ovarian cancer risk found that increased consumption of animal fat was associated with an increased risk of ovarian cancer, and that after adjusting for animal fat intake, caloric intake had minimal effects on risk.[135] Another study in Canada also found that fat consumption was associated with an increased risk of ovarian cancer (odds ratio of 1.20).[136] A meta-analysis found that fruit and vegetables have a protective effect for ovarian cancer.[37] A study that looked at incidence of cancer in those with diabetes found that those with diabetes have an increased risk of ovarian cancer.[137] A review of cancer risk and obesity found that obese persons (those with greater BMI) are at heightened risk of ovarian cancer.[138] The use of oral contraceptives was associated with a decreased risk of ovarian cancer.[139,140] Highest rates of incidence of ovarian cancer are seen in northern and western Europe and North America; the latitude covariates try to capture this pattern.[141] As the TFR of a country increases, the incidence of ovarian cancer decreases.

3.1.17 Testicular cancer

Fruits and vegetables[142] are considered protective against testis cancer as they are against many cancers. In addition, there is a documented association at the population level between smoking and testis cancer incidence.[143] Health System Access 2 is included as a standard covariate since access to a health system is expected to decrease mortality rates from any cause.

3.1.18 Kidney and other urinary organs cancer

In the kidney cancer cause of death model, health system access, smoking prevalence, and cumulative yearly cigarettes (15 year lag) were included as level one covariates while liters of alcohol was included as a level two covariate. In a review of articles about tobacco smoking and cancer, studies found that the average relative risk of kidney cancer for smokers as compared to non-smokers ranged from 1.5 to 2.0.[34] Similarly, in a study case-control study of kidney cancer in New South Wales, the relative risk of kidney cancer of ex-smokers compared to non-smokers was 1.41, and it was 2.17 for current smokers.[144] Tobacco chewing and smoking are related to increased risk of disease.[145] In a study of 5 ethnic groups in Hawaii, alcohol was associated with an increased risk of kidney cancer.[146] Health system access and TFR were included as covariates based on expert opinion. Since medical treatments that reduce kidney cancer mortality are available, access to the health system is presumed to decrease risk of death from kidney cancer.

3.1.19 Bladder cancer

The association between alcohol consumption and bladder cancer has been quite controversial, with numerous studies both confirming and denying links between the two. Because of its potential as a predictor variable, we included alcohol liters per capita in covariate selection.[147,148,149] Diets low in fruit and vegetable intake have been found to be associated with increased risk of bladder cancer.[150,151,152] Population density correlating with rural and urban living may influence bladder cancer mortality through exposure to harmful chemicals.[153,154] Bladder cancer has a history as an occupational disease with links to many chemical risk factors. Adequate health care services allow for early detection of bladder cancer and therefore improve survival.[155] A positive association is seen between smoking and fatal bladder cancer.[156] It is the most important risk factor for bladder cancer, so we included multiple smoking-related covariates in our tests to determine which had the strongest relationships with the data.[157,158]

3.1.20 Brain and nervous system cancer

Relatively little is known about the risk factors for brain cancer. While exposure to radiation and occupational chemical exposure have been suggested as being linked to brain cancer, the evidence is unclear, and our ability to capture these risk factors with covariates was limited. As a result, we chose to include a collection of risk factors in covariate selection that represented the full breadth and diversity of potential determinants. The association between alcohol consumption and brain cancer has been controversial, with numerous studies both confirming and denying links between the two.[159] Because of its potential as a predictor variable, we included alcohol liters per capita in covariate selection. Similarly, diets high in red meat and animal fat, as well as diets low in fruit and vegetable intake, may be associated with an increased risk of brain cancer.[160,161,162] Several studies also appear to show a positive association between smoking behaviors and brain cancers.[163,164] Access to health care services may allow for early detection of brain cancer and therefore improve survival.

3.1.21 Thyroid cancer

The most well documented risk factor for thyroid cancer is radiation, particularly radioactive iodine, exposure.[165] However, insufficient information was available to construct a covariate documenting changing exposure levels. The evidence of diet, alcohol, and tobacco is controversial with several studies showing weakly positive, insignificant, or negative relationships between these factors and thyroid cancer.[166,167,168] These covariates were included because of their possible link with thyroid cancer and their associations with increased incidence and mortality for cancer at many sites. Obesity has been linked with slightly elevated risks of thyroid cancer in US men (1.21 95% CI, 0.97-1.49) and women (1.16, 95% CI, 1.08-1.24)[169], and water and sanitation covariates were also included to test for possible relationships based on expert judgment.

3.1.22 Hodgkin lymphoma

Patients with a history of autoimmune disorders are at increased risk for the development of Hodgkin lymphoma.[170] We used latitude as a proxy to autoimmune disease which is generally more prevalent in northern European regions.

3.1.23 Non-Hodgkin lymphoma

In the non-Hodgkin lymphoma (NHL) cause of death model, health system access was included as a level one covariate while smoking prevalence, cumulative yearly cigarettes (10 year lag), and liters of alcohol per capita were included as level two covariates. In a case-control study in Uruguay, male beer drinkers showed an increased odds ratio of 5.5 for risk of NHL.[171] In that same study, smokers of black tobacco and hand-rolled cigarettes had an increased odds ratio of 3.5 for risk of NHL. Furthermore, men who had ever smoked cigarettes had a risk ratio of 2.1 for risk of dying from NHL in a study of white male insurance policy holders.[172] Smoking was associated with a slightly increased risk of NHL (odds ratio of 1.07) in a study that used data from the International Lymphoma Epidemiology Consortium.[173] Health system access and TFR were included as covariates based on expert opinion. Since treatment regimens are available for this cancer, access to the health system presumably decreases the risk of death from NHL.

3.1.24 Multiple myeloma

The literature on risks for multiple myeloma (MM) is less extensive than that for other sites. Several studies have found increased rates of MM among blacks in the United States, and these elevated rates have been linked to dietary factors, particularly fruit and vegetable intake.[174] Several studies have also shown a relationship between obesity and MM incidence.[175] There have been many studies investigating the link between MM and smoking, and the data is controversial with reported ORs above and below 1.0.[175] Because of the possibility of a relationship between the two, we included several smoking covariates in our models. There is very little evidence for a relationship between alcohol consumption and MM. However, the two studies indicating a slight relationship (OR 1.7, 95% CI 1.0-2.7) led us to include this covariate. Water and sanitation covariates were added as potential covariates based on expert opinions.

3.1.25 Leukemia

In the leukemia cause of death models, we used TFR, liters of alcohol per capita, smoking prevalence, cumulative yearly cigarettes (10 year lag) and health system access as level one covariates. Maternal drinking during pregnancy was associated with an odds ratio of 1.43 for infant acute myeloid leukemia.[176] Also, there was an increased risk of leukemia for children who were diagnosed at or before age 2 whose mothers reported drinking alcohol while pregnant.[177] In a case-control study of acute nonlymphocytic leukemia in western Washington state, smokers had a twofold increased risk of leukemia as compared with non-smokers; risk increased significantly with the number of pack-years smoked.[178] In comparison with those who never smoked, ex-smokers in a cohort study of Seventh-Day Adventists had a relative risk of 2.00 for leukemia; risks increased as numbers of cigarettes smoked daily increased, as well as with the duration of cigarette smoking.[179] In a meta-analysis of studies that investigated the association between cigarette smoking and adult leukemia, the relative risk derived from prospective studies was 1.3 for smokers, and the relative risk of leukemia for smokers from case-control studies was 1.1.[180] Health system access was included based on expert opinion with the assumption that access to treatment prevents or delays deaths.

3.2 Out-of-sample predictive validity of component models

As described in Foreman et al,[181] the ensemble modeling strategy assesses the performance of various component models. The ability of each of these models to make accurate predictions was formally evaluated by creating 50 train-test-test splits. For each of these datasets, 70% of the data was randomly assigned to the train set, 15% to the first test dataset and the last 15% to the second test dataset. For each train dataset, each of the proposed models was re-estimated including both the mixed effects and the spatial-temporal model. The results of the models estimated on the training data alone was used to predict for the first test set. The test data have not been included in the model estimation; the performance of each model was therefore being evaluated out-of-sample. In this way, the out-of-sample predictions for the test set are a fair evaluation of how each model performs in predicting cancer deaths where the data are sparse or missing.

Predictive validity was evaluated using three metrics. First, it was evaluated how well each model predicts age-specific death rates using the root mean squared error (RMSE) of the log of the death rate. Second, models were desired that predict accurate trends. The difference between the log of the death rate in year t and the log of the death rate in year t-1 was calculated for the test data where possible. The same metric was also computed for the prediction. The percentage of the time that the model predicted the same trend as the test data was then counted. Finally, models were desired that generate plausible prediction intervals, so the percent of the data in the test set included in the 95% prediction interval was computed. The prediction interval is based both on the uncertainty in the predicted death rate due to the models and the data variance for each observation. Based on the predictive validity tests, for each of the four groups the final model with the lowest RMSE and best trend metric was chosen. eTable 12 shows the out-of-sample predictive validity for all selected component models and includes the metrics explained above for each sub-model.

3.3 CAUSE OF DEATH CORRECTION FOR ALL-CAUSE MORTALITY

The models for each of the causes included in the GBD are single-cause fraction models. This means that the sum of the estimated cause-specific mortality may not equal the all-cause mortality envelope. In order to produce a more accurate estimate of these deaths over time, the CoDCorrect method was used, which corrects death estimates for each cause such that the sum of cause-specific mortality rates equals the all-cause mortality rate.[16] From an estimation perspective this is an important step as the data available to inform trends and levels in all-cause mortality are usually orders of magnitude larger than data for cause-specific mortality. Each cause is re-scaled according to the uncertainty around the cause-specific mortality rate. In other words, causes which are known with precision will not be affected as much by this re-scaling than causes which have large uncertainty.

4 YLLs ESTIMATION PROCESS

The number of years of life lost (YLL) due to cancer deaths was calculated by multiplying the number of deaths in each age group by the reference life expectancy for the corresponding age group. The reference life expectancy was calculated using the lowest mortality rate among all countries in 2013 for each age group shown in eTable 14.

5 INCIDENCE ESTIMATION

The CODEm ensemble model produces uncertainty intervals for each age-country-year for mortality. 1000 draws from these uncertainty intervals, and 1000 draws from the predicted MI ratios were taken to generate distributions of incidence cases and rates by age, country, and year. It was assumed that uncertainty in the MI ratio is independent of uncertainty in the estimated age-specific death rates. Through this process, distributions of mortality and incidence in all age-country-year groups were generated.

6 YLD ESTIMATION PROCESS

General methods for years lived with disability (YLD) estimation including generation of disability weights has been described in previous publications.[182,183] Estimation of YLDs from cancer included two main steps shown in eFigure 1. First, relative cancer survival was estimated by scaling cancer specific survival between a "best case" and "worst case" survival. Surveillance, Epidemiology, and End Results program (SEER) 2010 data was used to generate the "best case" survival curve for each cancer.[184] For the "worst case" survival curve survival from the 1950 US Mortality Files was compared to Cancer Survival in Africa, Asia, the Caribbean and Central America (SurvCan) data and whichever survival was the lowest was used.[185,186] The mean weighted average of registries that reported survival less or equal to the median survival for all SurvCan registries was used. This was done since the case numbers for some SurvCan registries were small and not considered representative. Since mesothelioma and gallbladder cancer was not included in the US Mortality Files from 1950 SEER 1975 survival data for the lower boundary was used. Cancer survival was then scaled for individual countries between these two boundaries based on an access to care variable. The access to care variable was calculated using the following formula:

$$Access\ to\ cancer\ care = 1 - \frac{Age\ standardized\ MI\ ratio_{cys} - Age\ standardized\ MI\ ratio_{min}}{Age\ standardized\ MI\ ratio_{max} - Age\ standardized\ MI\ ratio_{min}}$$

c=country; y=year; s=sex; Age-standardized MI ratio$_{min}$=lowest MI ratio for all countries and years; Age-standardized MI ratio$_{max}$=highest MI ratio for all countries and years

Deaths and incidence estimates described in the previous steps were used to calculate the age-standardized MI ratios by country and sex. These country, age, and sex specific relative survival estimates were then transformed into absolute survival, adjusting for background mortality using the following formula: $absolute\ survival = relative\ survival * e^{-\lambda t}$, where λ is derived from life-tables. Using the absolute survival estimates it was calculated how many deaths occurred for by age, sex, country, and GBD cancer group up to 10 years.

In the next step two main sequela groups were defined: general sequelae that apply to every cancer and cancer specific sequelae. General sequelae that were calculated for all cancers included four phases: the diagnosis and treatment phase, remission, metastatic or incurable phase, and terminal phase. The second set of sequelae is related to certain long-term adverse effects and includes mastectomy for breast cancer, stoma for colorectal cancer, incontinence due to bladder cancer, incontinence and impotence due to prostate cancer, and laryngectomy for laryngeal cancer.

To calculate YLD for the different cancers the person-years for the four general sequelae were estimated. Only the population that dies within 10 years experiences three sequelae (diagnosis/treatment, disseminated phase and terminal phase). The population that has

survived beyond 10 years only experiences disability due to diagnosis and treatment and remission. Duration of sequela 1 (Diagnosis and treatment) was estimated based on Neal et al. for esophageal, stomach, larynx, cervical, uterine, oral cavity, pancreas, testicular, kidney, bladder and nasopharyngeal cancer, cancer of other part of the pharynx, multiple myeloma and leukemia.[187] Since the duration described in this analysis did not include duration of treatment two months were added to account for the average treatment time. For lung, breast, prostate, colorectal, and ovarian cancer, Hodgkin, and non-Hodgkin lymphoma the durations described in Allgar et al. were used and two months were added to account for the average treatment duration.[188] For melanoma the duration until diagnosis described in Neal et al. was used and two months were added to account for treatment.[189] For liver, gallbladder, brain, thyroid cancer and mesothelioma duration of sequela 1 is based on expert opinion.
Duration of sequela 2 (remission) is 10 years for the survivors minus the duration of the other sequelae.
Duration of sequela 3 (disseminated phase) is based on SEER data for median survival of patients with stage IV disease for melanoma, mesothelioma, esophageal, stomach, liver, lung, breast, cervical, uterine, prostate, colorectal, gallbladder, ovarian, kidney, bladder, and pancreas cancer.[190] For thyroid, larynx, oral cavity, nasopharyngeal cancer and cancer of other part of the pharynx the SEER median survival of patients with stage IVc was used. For testicular cancer the SEER median survival of patients with stage III was used. For Hodgkin and non-Hodgkin lymphoma the duration of disseminated phase is based on Kewalramani et al.[192] For multiple myeloma, leukemia and other cancers SEER median overall survival of all patients regardless of stage was used. A duration of one month for the terminal phase was used for all cancers.
For cancer specific sequelae hospital data was used to estimate the number of cancer patients undergoing mastectomy, laryngectomy, stoma, prostatectomy and cystectomy which is shown in eTable 13. These proportions were used as input parameters for a proportion model in DisMod-MR 2.0 in order to estimate proportions for all countries, and different years. DisMod-MR 2.0 is a Bayesian meta-regression method used to generate consistent estimates of prevalence, incidence, remission, and mortality. It combines a compartmental model of disease progression with an age-integrating mixed-effects negative-binomial model of all relevant epidemiological data. The proportions generated in the last step were applied to the incidence cases and these results were used again as an input for DisMod-MR 2.0 with a remission specification of zero and the cause specific mortality of the specific cancer to obtain prevalence of the sequela. By using the cause specific mortality the simplifying assumption was made that survival for cancer patients undergoing procedures is the same as for cancer patients who do not need a procedure. Since the hospital procedure codes to not reveal the underlying disease it was estimated that 58% of stomas are done for colorectal cancer patients based on a literature review.[193–196] It was estimated that 18% of patients after prostatectomy experience incontinence and 55% experience impotence.[197–204] Prevalence estimates were adjusted based on these proportions.
Lastly, the procedure sequelae prevalence was multiplied with disability weights for the procedures to obtain the number of YLDs. Disability weights were derived from population based surveys.[205] These YLDs were then added to the YLDs for the specific cancer for the general sequelae.

7 DECOMPOSITION OF TRENDS BETWEEN 1990 AND 2013

Three primary factors drive the trend of number of cases, or deaths from 1990 to 2013: population growth, population age and sex structure, and age- and sex-specific rates. To estimate the effect of population growth, two scenarios were calculated: In scenario (1) the population size of 2013 was applied onto the rate, sex, and age structure of 1990. The difference between the 1990 numbers and the numbers estimated by applying the 2013 population size to the 1990 rate, age, and sex structure is only due to population growth. In scenario (2) the effect of aging was estimated by applying the 1990 age-sex specific rates to the 2013 age-sex specific population numbers. The difference between scenario (2) and scenario (1) is due to aging of the population. The difference between 2013 numbers and scenario (2) is due to a change in age-sex specific rates. The effects were calculated as the percent change in the number of the cases or deaths for each factor compared to 2013. The analysis was done for the global level (Table 2) and separately for developing and developed countries (eTables 17a and 17b).

8 CUMULATIVE PROBABILITY OF DEVELOPING CANCER

The cumulative probability of developing cancer for certain age groups and an approximated lifetime risk for all cancer groups (age 0 to 79) for 2013 on the global level in the absence of competing causes of death was calculated (eTable 18).[206] The cumulative risk is approximated using the following formula:

$$Cumulative\ risk = 100x(1 - e^{(-cumulative\ rate/100)})$$

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
Algeria	Setif	1987, 1991, 2000, 2005	4	4	0		0	0	0
	Batna	2000-2006	7	0	7		0	0	0
	Oran	2005-2006	2	0	2		0	0	0
	Algiers	1995	1	1	0		0	0	0
Argentina	Mendoza	2005	1	1	0		0	0	0
	Bahia Blanca	1995, 2000, 2005	3	3	0	1995, 2000	2	2	0
	Tierra del Fuego	2005	1	1	0		0	0	0
	Concordia	1992, 1995	2	2	0	1992, 1995	2	2	0
	Cordoba	2005	1	1	0		0	0	0
Australia	South	1980-1981	2	2	0	1977, 1980, 1985, 1990, 1995, 2000	6	6	0
	New South Wales	1980	1	1	0	1975, 1980, 1985, 1995, 2000	5	5	0
	Capital Territory	1980	1	1	0	1980, 1985, 1995, 2000	4	4	0
	Western	1982	1	1	0	1982, 1990, 2000	3	3	0
	Victoria		0	0	0	1982-2007	26	1	26
	Tasmania	1980-1981	2	2	0	1980, 1985, 1990, 1995, 2000-2006	11	5	6
	Queensland	1982	1	1	0	1982, 1993-2003, 2006-2007	14	2	14
	Australia National Registry	1982-2009	28	0	28		0	0	0
	Northern Territory	1995	1	1	0	1995, 2000	2	2	0
Austria	Austria National Registry	2000	1	1	0	2000	1	1	0
	Tyrol		0	0	0	1990, 1995, 2000	3	3	0
	Vorarlberg		0	0	0	1995, 2000	2	2	0
Bahrain	Bahrain National Registry	2000, 2005	2	2	0	2000	1	1	0
Belarus	Belarus National Registry	1985, 1990, 1995, 2000, 2005	5	5	0	1985, 1990, 1995, 2000	4	4	0
Belgium	Flanders	1999	1	1	0	2000	1	1	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Belgium National Registry	2003-2010	8	0	8		0	0	0
	Flanders less Limburg	1997	1	1	0		0	0	0
	Limburg	1997	1	1	0		0	0	0
	Antwerp	2000	1	1	0		0	0	0
Bermuda	Bermuda National Registry	1985	1	1	0		0	0	0
Brazil	Porto Alegre	1980, 1987, 1991	3	3	0	1981, 1987, 1991	3	3	0
	Recife	1980	1	1	0	1970	1	1	0
	Cuiaba	2001, 2004	2	2	0	2001	1	1	0
	Goiania	1988-2002, 2005	16	16	0	1989, 1992, 2001	3	3	0
	Belo Horizonte	2004	1	1	0		0	0	0
	Campinas	1993	1	1	0	1993	1	1	0
	Aracaju	2004	1	1	0		0	0	0
	Fortaleza	1980, 2004	2	2	0	1980	1	1	0
	Sao Paulo	2000, 2005	2	2	0	1969, 1973, 1978, 2000	4	4	0
	Belem	1990	1	1	0	1990	1	1	0
	Brasilia	1999	1	1	0	2000	1	1	0
Bulgaria	Bulgaria National Registry	2000, 2006	2	1	1	2000	1	1	0
Canada	Prince Edward Island	1983-1984, 1986-1989, 1991-1994, 1996-1999, 2001-2002, 2005	17	17	0	1980, 1985, 1990, 1995, 2000	5	5	0
	Saskatchewan	1981-1984, 1986-1989, 1991-1994, 1996-1999, 2001-2005	21	19	2	1971, 1975, 1980, 1985, 1990, 1995, 2000	7	7	0
	Maritime Provinces		0	0	0	1971, 1975, 1980, 1985	4	4	0
	Northwest Territories and Yukon		0	0	0	1975, 1980, 1985	3	3	0
	Nova Scotia	1981-1984, 1986-1989, 1991-1994, 1996-1999, 2001-2002, 2005	19	19	0	1980, 1985, 1990, 1995, 2000	5	5	0
	Newfoundland	1981-1984, 1986-1989,	18	18	0		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
		1991-1994, 1996-1999, 2001-2002							
	Quebec	2005	1	1	0	1971, 1975, 1980, 1985, 1990, 1995	6	6	0
	Canada National Registry	1980, 1985, 1990, 1995, 2000	5	5	0	1980, 1990, 1995, 2000	4	4	0
	New Brunswick	1981-1984, 1987-1989, 1991-1994, 1996-1999, 2001-2002, 2004-2006	20	18	2	1980, 1985, 1990, 1995, 2000	5	5	0
	Alberta	1981-1984, 1986-1989, 1991-1994, 1996-1999, 2001-2002, 2005	19	19	0	1971, 1975, 1980, 1990, 2000	5	5	0
	British Columbia	1981-1984, 1986-1989, 1991-1994, 1996-1999, 2001-2002, 2005	19	19	0	1971, 1975, 1980, 1985, 1990, 1995, 2000	7	7	0
	Newfoundland and Labrador	2005	1	1	0	1971, 1975, 1980, 1985, 1990, 1995, 2000	7	7	0
	Manitoba	1981-1984, 1986-1989, 1991-1994, 1996-1999, 2001-2002, 2005	19	19	0	1971, 1975, 1980, 1985, 1990, 1995, 2000	7	7	0
	Ontario	1981-1984, 1986-1989, 1991-1994, 1996-1999, 2001-2002, 2005	19	19	0	1970, 1980, 1985, 1990, 1995, 2000	6	6	0
	Northwest Territories	2005	1	1	0	1990, 2000	2	2	0
	Yukon	1987, 2005	2	2	0	1988	1	1	0
Chile	Antofogasta	2005	1	1	0		0	0	0
	Valdivia	2000, 2005	2	2	0	2000	1	1	0
	Biobio	2005	1	1	0		0	0	0
	Los Rios	2005	1	0	1		0	0	0
China	Dehui City Jilin	2009	1	0	1		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Yanshi City Henan	2009	1	0	1		0	0	0
	Guangzhou		0	0	0	2001	1	1	0
	Shexian County Hebei	2003-2009	7	0	7		0	0	0
	Jianhu County Jiangsu	2003-2009	7	0	7		0	0	0
	Jiangsu Qidong City	1985	1	1	0		0	0	0
	Gejiu City Yunnan	2008	1	0	1		0	0	0
	Shanghai	1980, 1985, 1988-2004, 2006-2009	23	4	19	1975, 1980, 1985, 1990, 1995, 2000	6	6	0
	Feixi County Anhui	2009	1	0	1		0	0	0
	Maanshan City Anhui	2003-2009	7	0	7		0	0	0
	Donghai County Jiangsu	2009	1	0	1		0	0	0
	Tianjin	1981, 1985, 1990-2004	17	2	15	1982, 1985, 1990, 1995	4	4	0
	Xining City Qinghai	2009	1	0	1		0	0	0
	Changle City Fujian	1990-2009	20	0	20		0	0	0
	Shangyu City Zhejiang	2009	1	0	1		0	0	0
	Qidong City Jiangsu	1990-2009	20	0	20		0	0	0
	Huaian District Jiangsu	1998-2009	12	0	12		0	0	0
	Yangquan City Shanxi	2009	1	0	1		0	0	0
	Zhanggong District Jiangxi	2009	1	0	1		0	0	0
	Xiping County Henan	2009	1	0	1		0	0	0
	Cixian County Hebei	1990-2004, 2006-2009	19	0	19		0	0	0
	Ziliujing District Sichuan	2009	1	0	1		0	0	0
	Tongling City Anhui	2008-2009	2	0	2		0	0	0
	Zhongshan City Guangdong	1998-2004, 2006-2009	11	0	11		0	0	0
	Hong Kong	1980, 1983-2002	21	21	0	1976, 1980, 1985, 1990, 1995, 2000	6	6	0
	Jintan City Jiangsu	2003-2007, 2009	6	0	6		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Yangcheng County Shanxi	2003-2004, 2006-2009	6	0	6		0	0	0
	Dandong City Liaoning	2008-2009	2	0	2		0	0	0
	Zhuanghe City Liaoning	2009	1	0	1		0	0	0
	Guangzhou City Guangdong	2000, 2002-2009	9	0	9		0	0	0
	Dalian City Liaoning	1998-2009	12	0	12		0	0	0
	Daoli District Heilongjiang	2005-2009	5	0	5		0	0	0
	Huaiyin District Jiangsu	2009	1	0	1		0	0	0
	Yangzhong City Jiangsu	1998-2009	12	0	12		0	0	0
	Taixing City Jiangsu	2004-2005, 2007-2009	5	0	5		0	0	0
	Hengdong County Hunan	2009	1	0	1		0	0	0
	Haining City Zhejiang	1998-2009	12	0	12		0	0	0
	Haimen City Jiangsu	2003-2009	7	0	7		0	0	0
	Hangzhou City Zhejiang	2000-2009	10	0	10		0	0	0
	Haian County Jiangsu	2009	1	0	1		0	0	0
	Kunes County Xinjiang	2009	1	0	1		0	0	0
	Liuzhou City Guangxi	2009	1	0	1		0	0	0
	Jinhu County Jiangsu	2007-2009	3	0	3		0	0	0
	Beijing	1990-2004, 2006-2009	19	0	19	1995	1	1	0
	Jiaxing City Zhejiang	2000-2005, 2007-2009	9	0	9		0	0	0
	Sihui City Guangdong	1998-2009	12	0	12		0	0	0
	Suzhou City Jiangsu	2006-2009	4	0	4		0	0	0
	Wenshang County Shandong	2009	1	0	1		0	0	0
	Liangzhou District Gansu	2008-2009	2	0	2		0	0	0
	Jiulongpo District Chongqing	2004, 2007, 2009	3	0	3		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Xuyi County Jiangsu	2009	1	0	1		0	0	0
	Wuhan		0	0	0	1995	1	1	0
	Taiwan		0	0	0	1980-2007	28	1	28
	Yanji City Jilin	2009	1	0	1		0	0	0
	Nangang District Harbin City		0	0	0	2000	1	1	0
	Shangzhi City Heilongjiang	2009	1	0	1		0	0	0
	Linzhou City Henan	1990-2009	20	0	20		0	0	0
	Wuhan City Hubei	1990-2004, 2006-2009	19	0	19		0	0	0
	Qidong County		0	0	0	1985, 1990, 1995	3	3	0
	Lianyungang Jiangsu	2007-2009	3	0	3		0	0	0
	Qingyang District Sichuan	2009	1	0	1		0	0	0
	Benxi City Liaoning	2003-2009	7	0	7		0	0	0
	Dafeng City Jiangsu	2003-2009	7	0	7		0	0	0
	Jingtai County Gansu	2009	1	0	1		0	0	0
	Xianju County Zhejiang	2009	1	0	1		0	0	0
	Yanting County Sichuan	1998-2004, 2006-2009	11	0	11		0	0	0
	Xiamen City Fujian	2009	1	0	1		0	0	0
	Feicheng City Shandong	1998-2009	12	0	12		0	0	0
	Bading City Hebei	2009	1	0	1		0	0	0
	Fusui County Guangxi	1990-1997, 2003-2009	15	0	15		0	0	0
	Chifeng City Inner Mongolia	2009	1	0	1		0	0	0
	Anshan City Liaoning	1998-2009	12	0	12		0	0	0
	Jiashan County Zhejiang	1990-2004, 2006-2009	19	0	19		0	0	0
	Guanyun County Jiangsu	2007, 2009	2	0	2		0	0	0
	Yunmeng County Hubei	2009	1	0	1		0	0	0
	Wuxi Jiangsu	2006	1	0	1		0	0	0
	Jiashan		0	0	0	1995	1	1	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Linqu County Shandong	1998-2009	12	0	12		0	0	0
	Sheyang County Jiangsu	2008-2009	2	0	2		0	0	0
	Donggang City Liaoning	2009	1	0	1		0	0	0
	Heilongjiang Nangang District	1992-2009	18	0	18		0	0	0
	Qianxi County Hebei	2009	1	0	1		0	0	0
	Shenyang City Liaoning	2003-2009	7	0	7		0	0	0
Colombia	Cali	1983-2002	20	20	0	1969, 1974, 1984, 1989, 1994, 2000	6	6	0
Costa Rica	Costa Rica National Registry	1980-2002, 2005	24	24	0	1981, 1986, 1990, 1995, 2000	5	5	0
Cote d'Ivoire	Cote d'Ivoire National Registry	1996	1	0	1		0	0	0
Croatia	Croatia National Registry	1989, 1995, 2000, 2005	4	4	0	1990, 1995, 2000	3	3	0
Cuba	Cuba National Registry	1986	1	1	0	1970, 1975, 1987	3	3	0
	Villa Clara	1996, 2005	2	2	0	1996	1	1	0
Cyprus	Cyprus National Registry	2000, 2005	2	2	0	2000	1	1	0
Czech Republic	Czech Republic National Registry	1983-2010	28	21	7	1990, 1995, 1998-2002	7	2	5
Denmark	Denmark National Registry	1980-2011	32	23	9	1970-2008	39	3	39
Ecuador	Cuenca	2005	1	1	0		0	0	0
	Quito	1985-2002, 2005	19	19	0	1986, 1995, 2000	3	3	0
Egypt	Minia	2009	1	0	1		0	0	0
	Aswan	2008	1	0	1		0	0	0
	Gharbiah	2000, 2005	2	2	0	2001	1	1	0
	Damietta	2009	1	0	1		0	0	0
Estonia	Estonia National Registry	1980-2008	29	24	5	1985, 1990, 1995, 2000	4	4	0
Finland	Finland National Registry	1980-2011	32	24	8	1968, 1970-2008	40	5	39
France	La Martinique	2000	1	1	0	2000	1	1	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Doubs	1980-2002, 2005	24	24	0	1985, 1990, 1995, 2000	4	4	0
	Tarn	1983-2002, 2005	21	21	0	1985, 1990, 1995, 2000	4	4	0
	Isere	1980-2002, 2005	24	24	0	1985, 1990, 1995, 2000	4	4	0
	Côte-d'Or	1995	1	1	0		0	0	0
	Somme	1983-2002, 2005	21	21	0	1984, 1990, 1995, 2000	4	4	0
	Haut-Rhin	1988-2002, 2005	16	16	0	1990, 1995, 2000	3	3	0
	Cote d'Or		0	0	0	1995	1	1	0
	Vendee	2005	1	1	0	2000	1	1	0
	Martinique	1981, 1985, 1994-1995, 2000, 2005	6	6	0	1994	1	1	0
	La Reunion	1990, 1993	2	2	0	1990, 1994	2	2	0
	Herault	1988-2002, 2005	16	16	0	1990, 2000	2	2	0
	Manche	1995, 2000, 2005	3	3	0	1996, 2000	2	2	0
	Loire-Atlantique	2000, 2005	2	2	0	2000	1	1	0
	Bas-Rhin	1980-2002, 2005	24	24	0	1985, 1990, 1995, 2000	4	4	0
	Calvados	1980-2002, 2005	24	24	0	1985, 1990, 1995, 2000	4	4	0
French Poly-nesia	French Polynesia National Registry		0	0	0	2000	1	1	0
	Sachsen	2007-2008	2	0	2		0	0	0
	Brandenburg Common Cancer Registry	2003-2004, 2006	3	0	3		0	0	0
	Brandenburg	2000, 2005, 2007-2008	4	2	2	2000, 2005-2006	3	1	2
	Free State of Saxony	2000, 2005	2	2	0	2000	1	1	0
Germany	Schleswig Holstein	2005	1	1	0		0	0	0
	Thuringen	2007-2008	2	0	2		0	0	0
	Northrhine Westphalia	2005	1	1	0		0	0	0
	Mecklenburg Vorpommern	2007-2008	2	0	2		0	0	0
	Mecklenburg-Western Pomerania	2000, 2005	2	2	0	2000	1	1	0
	Sachsen Anhalt	2007-2008	2	0	2		0	0	0
	Munich	2000, 2005	2	2	0	2000	1	1	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Bavaria	2004	1	0	1	2004	1	0	1
	Northrhine-Westphalia: Munster	2000, 2003	2	1	1	2003	1	0	1
	Hamburg	2000, 2003-2007	6	2	4	1971, 1975, 1979, 2000, 2003-2007	9	4	5
	Berlin	2007-2008	2	0	2		0	0	0
	Eastern States (ex-GDR)	1980, 1985, 1988	3	3	0	1970, 1975, 1980, 1985, 1989	5	5	0
	Erfassungsgebiet gesamt (All areas)	2007-2008	2	0	2		0	0	0
	Bremen	2005	1	1	0		0	0	0
	Saarland	1980-2002, 2004-2005	25	24	1	1970, 1975, 1980, 1985, 1990, 1995, 2000	7	7	0
Greece	Greece National Registry	1990	1	0	1		0	0	0
Guinea	Conakry	1993	1	0	1		0	0	0
Hungary	Hungary National Registry	2001-2011	11	0	11		0	0	0
	County Vas	1980, 1985	2	2	0	1970, 1975	2	2	0
	County Szabolcs-Szatmar	1980, 1985	2	2	0	1970, 1975, 1980, 1985	4	4	0
Iceland	Iceland National Registry	1980-2011	32	23	9	1970-2008	39	2	39
India	Ahmedabad	1985, 1995, 2004, 2006	4	2	2	2004-2005	2	0	2
	Kamrup Urban District	2005-2006, 2010	3	0	3		0	0	0
	Kolkata	2005-2006, 2008	3	0	3	2004-2005	2	0	2
	Barshi	1990, 2004, 2006	3	1	2	2004-2005	2	0	2
	Kollam	2006, 2009	2	0	2		0	0	0
	Aizawl	2005	1	0	1		0	0	0
	Ahmedabad Urban	2009	1	0	1		0	0	0
	Chennai	1982-2002, 2004-2006, 2009	25	22	3	1985, 1990, 2000, 2004-2005	5	3	2
	Manipur State	2006, 2009	2	0	2		0	0	0
	Cachar District	2006, 2009	2	0	2		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Delhi	1994, 2004, 2006, 2008	4	1	3	2004-2005	2	0	2
	Dindigul Ambillikai	2005	1	1	0		0	0	0
	Silchar	2005	1	0	1		0	0	0
	Karunagappally	1991, 1995, 2000, 2005	4	4	0	2000	1	1	0
	Tripura State	2010	1	0	1		0	0	0
	Pune	1980, 1995, 2000, 2005-2006, 2009	6	4	2	1975, 1980	2	2	0
	Trivandrum	1991, 1995, 2000, 2006	4	4	0	1992	1	1	0
	Nagpur	1981, 1995, 2000, 2006, 2008	5	3	2	1981	1	1	0
	Thiruvananthapuram	2006, 2010	2	0	2		0	0	0
	Mizoram excl Aizawl	2005	1	0	1		0	0	0
	Barshi Paranda and Bhum	2005	1	1	0		0	0	0
	Ahmedabad Rural	2009	1	0	1		0	0	0
	Mizoram State	2005-2006, 2009	3	1	2		0	0	0
	Barshi Rural	2009	1	0	1		0	0	0
	New Delhi	2000, 2005	2	2	0		0	0	0
	Dibrugarh District	2005-2006, 2010	3	0	3		0	0	0
	Wardha	2010	1	0	1		0	0	0
	Sikkim State	2005-2006, 2010	3	1	3		0	0	0
	Aurangabad	2006, 2009	2	0	2		0	0	0
	Bangalore	1982, 1985, 1990, 1995, 2004, 2006, 2008	7	5	2	1985, 1990, 2004-2005	4	2	2
	Bhopal	2004-2006, 2009	4	1	3	2004-2005	2	0	2
	Meghalaya	2010	1	0	1		0	0	0
	Barshi Expanded	2009	1	0	1		0	0	0
	Imphal	2005	1	0	1		0	0	0
	Mumbai	1980-2002, 2004-2006, 2009	27	24	3	1970, 1980, 1985, 1990, 2000, 2004-2005	7	5	2
	Bombay		0	0	0	1974	1	1	0
	Nagaland	2010	1	0	1		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
Iran	Iran National Registry	2003-2006	4	0	4		0	0	0
	Golestan	1998, 2006	2	1	1		0	0	0
	Ardabil	1985, 1997, 2006-2008	5	0	5		0	0	0
Ireland	Southern	1981, 1984, 1990	3	3	0	1981, 1985, 1990	3	3	0
	Ireland National Registry	1994-2010	17	2	17	1996, 2000	2	2	0
Israel	Israel National Registry	1980, 1984-1985, 1990, 1995, 2000, 2005, 2008-2010	10	7	3	1969, 1974, 1995, 2000	4	4	0
Italy	Florence	1985-2002	18	18	0		0	0	0
	North East	1996, 2000	2	2	0	1996, 2000	2	2	0
	Sassari Province	1995, 2000	2	2	0	1995, 2000	2	2	0
	Italy National Registry	2004-2008	5	0	5		0	0	0
	Naples	2000	1	1	0	2000	1	1	0
	Torino	1984-2002	19	19	0	1985, 1990, 1995, 2000	4	4	0
	Sondrio	2000, 2003	2	1	1	2000	1	1	0
	Salerno Province	1999	1	1	0	2000	1	1	0
	Varese Province	1980-2000	21	21	0	1977, 1980, 1985, 1990, 1995, 1999	6	6	0
	Syracuse Province	2000	1	1	0	2001	1	1	0
	Reggio Emilia Province	2000	1	1	0	2000	1	1	0
	Romagna Region		0	0	0	1986, 1991, 1995, 2000	4	4	0
	Florence and Prato	1986, 1989-1990, 1995, 2000	5	5	0	1986, 1990, 1995, 2000	4	4	0
	Modena Province	1988-2003	16	15	1	1990, 1995	2	2	0
	Veneto Region	1990, 1994, 1999	3	3	0	1990, 1995, 2000	3	3	0
	Parma Province	1980-2002	23	23	0	1980, 1985, 1990, 1995	4	4	0
	Genova	1986, 1990, 1994, 1999	4	4	0		0	0	0
	Biella Province	1996, 2000	2	2	0	1996, 2000	2	2	0
	Umbria	1995	1	1	0	1995, 2000-2005	7	2	6
	Ferrara Province	1991, 1995, 2000	3	3	0	1992, 1995, 2000	3	3	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Genoa	1986, 1990, 1994, 1999	4	4	0	1987, 1990, 1995, 1999	4	4	0
	Romagna Province	1986, 1988-2002	16	16	0		0	0	0
	Macerata Province	1991, 1995, 1999	3	3	0	1992, 1995, 1999	3	3	0
	Brescia Province	2000	1	1	0	2000	1	1	0
	Trieste	1984-1985, 1990	3	3	0	1985, 1991	2	2	0
	Ragusa Province	1980-1981, 1983-2002	22	22	0	1980, 1987, 1990, 1995, 2000	5	5	0
	Milan	2000	1	1	0	2001	1	1	0
	Latina	1984, 1989	2	2	0	1984, 1990	2	2	0
Jamaica	Jamaica National Registry	1980, 1990, 1995	3	0	3		0	0	0
	Kingston and St Andrew	2005	1	1	0		0	0	0
Japan	Miyagi Prefecture	1980-2002, 2005	24	24	0	1970, 1975, 1980, 1985, 1990, 1995, 2000	7	7	0
	Saga Prefecture	1985, 1990, 1995, 2005	4	4	0	1985, 1990, 1995	3	3	0
	Fukuoka Prefecture		0	0	0	1975	1	1	0
	Hiroshima	1983, 1988, 1993, 1998, 2005	5	5	0	1979, 1983, 1988, 1993, 1998	5	5	0
	Osaka Prefecture	1980-2002, 2005	24	24	0	1971, 1975, 1981, 1985, 1990, 1995, 2000	7	7	0
	Yamagata Prefecture	1983-2002	20	20	0	1985, 1990, 1995, 2000	4	4	0
	Nagasaki Prefecture	1980, 1985, 1990, 1995, 2000, 2005	6	6	0	1975, 1980, 1985, 1990, 1995, 2000	6	6	0
	Fukui Prefecture	2000, 2005	2	2	0	2000	1	1	0
	Okayama		0	0	0	1969	1	1	0
	Aichi Prefecture	2000, 2005-2006	3	2	1	2000, 2006	2	1	1
	Niigata Prefecture	2005	1	1	0		0	0	0
Jordan	Jordan Cancer Registry	2001-2008	8	0	8		0	0	0
Kenya	Nairobi Cancer Registry	2000-2002	3	0	3		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
Kuwait	Kuwait National Registry	1980, 1985, 1996, 2000, 2005	5	5	0	1981, 1985, 1996	3	3	0
Kyrgyzs-tan	Kyrgyzstan National Registry	1986	1	1	0	1987	1	1	0
Latvia	Latvia National Registry	1985, 1988-2002, 2005	17	17	0	1985, 1990, 1995, 2000	4	4	0
Lebanon	Lebanon National Registry	1998, 2005-2007	4	0	4		0	0	0
Libya	Benghazi	2004	1	1	0		0	0	0
Lithuania	Lithuania National Registry	1980-2003, 2005, 2010-2011	27	24	3	1995, 2000	2	2	0
Malawi	Blantyre	1996, 2005	2	1	1		0	0	0
Malaysia	Sarawak	2000	1	1	0	2000	1	1	0
	Malaysia National Registry	2003	1	0	1		0	0	0
	Penang	2000, 2005	2	2	0	2000	1	1	0
Mali	Bamako	1988, 1990, 1995	3	3	0		0	0	0
Malta	Malta National Registry	1992, 1995, 1999-2010	14	4	11	1971, 1993, 1995, 2000	4	4	0
Mongolia	Mongolia National Registry	2005	1	0	1		0	0	0
Morocco	Greater Casablanca	2004	1	0	1		0	0	0
Namibia	Namibia National Registry	2002	1	0	1		0	0	0
Nether-lands	Netherlands National Registry	1990, 1995, 2000, 2003-2007	8	3	5	1991, 1995, 2000	3	3	0
	Eindhoven	1980-2002	23	23	0	1980, 1985, 1990, 1995	4	4	0
	Maastricht	1987, 1990, 1995, 2000	4	4	0	1987, 1990, 1995, 2000	4	4	0
	Antilles less Aruba	1980	1	1	0		0	0	0
New Zealand	New Zealand National Registry	1983-2007	25	21	4	1970, 1980, 1985, 1990, 1995, 2000, 2003-2007	11	6	5
Nigeria	Ibadan		0	0	0	1965	1	1	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
Norway	Norway National Registry	1980-2010	31	24	7	1970-2007	38	4	38
Oman	Oman National Registry	1995, 1999, 2002-2008	9	2	7		0	0	0
Pakistan	South Karachi	1996, 2000	2	2	0		0	0	0
Palestine	West Bank	2010-2011	2	0	2		0	0	0
Panama	Panama National Registry		0	0	0	1999	1	0	1
Paraguay	Asuncion	1988	1	1	0		0	0	0
Peru	Lima	1990	1	1	0		0	0	0
	Trujillo	1985, 1989, 2000	3	3	0	1986, 1989	2	2	0
Philip-pines	Manila	1983-2002, 2005	21	21	0	1985	1	1	0
	Rizal	1980, 1985, 1995, 2005	4	4	0	1980, 1985	2	2	0
Poland	Nowy Sacz	1984	1	1	0	1975, 1980, 1985	3	3	0
	Lower Silesia	1985, 1990, 1995	3	3	0	1986, 1990, 1995	3	3	0
	Cracow City	1982-1983, 1987-1989, 1991-1993, 1996-1999, 2001-2002	14	14	0		0	0	0
	Cracow	1980, 1984-1985, 1990, 1995, 2000	6	6	0	1970, 1975, 1980, 1985, 1990, 1995, 2000	7	7	0
	Kielce	1988-1994, 1996-2002	14	14	0	1990, 1995, 2000	3	3	0
	Poland National Registry	2003-2010	8	0	8		0	0	0
	Opole	1986	1	1	0	1986	1	1	0
	Katowice District		0	0	0	1971	1	1	0
	Warsaw Rural Areas	1985	1	1	0	1970, 1975, 1985	3	3	0
	Cieszyn Area		0	0	0	1970, 1975	2	2	0
	Warsaw City	1981, 1985, 1988-1993, 1995-2002	16	16	0	1970, 1975, 1985, 1991, 1995, 2000	6	6	0
Portugal	Vila Nova De Gaia	1985, 1995	2	2	0	1985	1	1	0
	Porto	2000	1	1	0	2000	1	1	0
	South Regional	2000	1	1	0	2000	1	1	0
	Azores	2005	1	1	0		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
Puerto Rico	Puerto Rico National Registry	1985, 1989, 1992	3	3	0		0	0	0
Qatar	Qatar National Registry	2005	1	1	0		0	0	0
Romania	County Timis		0	0	0	1971	1	1	0
	County Cluj	1980, 1985	2	2	0	1976, 1981, 1985	3	3	0
Russia	St Petersburg	1985, 1995, 2000, 2005	4	4	0	1985, 1996, 2000	3	3	0
Samoa	Samoa National Registry	1984	1	0	1		0	0	0
Saudi Arabia	Saudi Cancer Registry	1994-2005	12	0	12		0	0	0
Serbia	Central	2005	1	1	0		0	0	0
	Yugoslavia Vojvodina	1990, 1995	2	2	0		0	0	0
	Serbia National Registry	2000	1	1	0	2001	1	1	0
Singa-pore	Singapore National Registry	1980, 1985, 1990, 1995, 2000, 2004-2008	10	6	4	1970, 1975, 1995, 2000	4	4	0
Slovakia	Slovakia National Registry	1980-2002, 2005	24	24	0	1990, 1995, 2000	3	3	0
Slovenia	Slovenia National Registry	1980-2009	30	24	6	1970, 1980, 1985, 1990, 1995, 2000-2007	13	6	7
South Africa	PROMEC	2005	1	1	0		0	0	0
	South Africa National Registry	2000, 2003-2005	4	0	4		0	0	0
South Korea	Seoul	1995, 2000	2	2	0	1995, 2000	2	2	0
	Incheon	2000	1	1	0	2000	1	1	0
	Daejeon	2000	1	1	0	2000	1	1	0
	South Korea National Registry	2000, 2003-2008, 2010	8	2	6	2001	1	1	0
	Gwangju	2000	1	1	0	2000	1	1	0
	Ulsan	2000	1	1	0	2001	1	1	0
	Kangwha County	1989, 1995	2	2	0	1989, 1995	2	2	0
	Jejudo	2001	1	1	0	2001	1	1	0
	Busan	1996, 2000	2	2	0	1997, 2000	2	2	0
	Daegu	1997, 2000	2	2	0	1998, 2000	2	2	0
Spain	Granada	1985-2002, 2005	19	19	0	1986, 1990, 1995, 2000	4	4	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Murcia	1983-1996, 1998-2001, 2005	19	19	0	1986, 1990, 1995, 1999	4	4	0
	La Rioja	2005	1	1	0		0	0	0
	Navarra	1980-2002, 2005	24	24	0	1975, 1980, 1985, 1989, 1995, 2000	6	6	0
	Basque Country	1986, 1989, 1999, 2005	4	4	0	1987, 1990, 2000	3	3	0
	Albacete	1991, 1995, 1999, 2005	4	4	0	1992, 1995, 2000	3	3	0
	Asturias	1989, 1993, 1998, 2005	4	4	0	1990, 1994, 1998	3	3	0
	Zaragoza	1980-2000	21	21	0	1970, 1980, 1988, 1993, 1998	5	5	0
	Canary Islands	1994, 1999, 2003-2004	4	3	1	1994, 1999	2	2	0
	Ciudad Real	2005	1	1	0		0	0	0
	Cuenca	1995, 2000, 2005	3	3	0	1995, 2000	2	2	0
	Tarragona	1981, 1983-2001, 2005	21	21	0	1982, 1990, 1995, 2000	4	4	0
	Girona	1995-1996, 2000, 2005	4	4	0	1996, 2000	2	2	0
	Mallorca	1990, 1994, 2005	3	3	0	1990, 1995	2	2	0
Sri Lanka	Sri Lanka National Registry	2003, 2005	2	0	2		0	0	0
Sweden	Sweden National Registry	1980-2007, 2009-2010	30	24	6	1968, 1970-2007	39	4	38
Switzer-land	Vaud	1980, 1985, 1990, 1994, 2000	5	5	0	1976, 1980, 1985, 1990, 1995, 2000	6	6	0
	Valais	1990, 1995, 2000	3	3	0	1991, 1995, 2000	3	3	0
	Neuchatel	1980, 1985, 1990, 1994, 2000	5	5	0	1975, 1980, 1985, 1990, 1995, 2000	6	6	0
	Switzerland National Registry	2005	1	0	1	2003-2007	5	0	5
	Geneva	1980-2002	23	23	0	1971, 1975, 1981, 1985, 1990, 1995, 2000	7	7	0
	St Gall-Appenzell	1983-2002	20	20	0	1985, 1990, 1995, 2000	4	4	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Graubunden and Glarus	2000	1	1	0	2000	1	1	0
	Urban Vaud	1980	1	1	0		0	0	0
	Ticino	1996, 2000	2	2	0	1997, 2000	2	2	0
	Graubunden		0	0	0	1991	1	1	0
	Zurich	1981, 1985, 1990, 1994	4	4	0	1981, 1985, 1990, 1995	4	4	0
	Rural Vaud	1980	1	1	0		0	0	0
	Basel	1981, 1985, 1990, 1995	4	4	0	1982, 1985, 1990, 1995	4	4	0
Taiwan	Taiwan	1980-2007	28	0	28		0	0	0
Thailand	Songkhla	1994-1995, 2000, 2002, 2005	5	4	1	2000	1	1	0
	Prachuap Khiri	2002	1	0	1		0	0	0
	Bangkok	1996, 2002, 2005	3	2	1		0	0	0
	Chon Buri	2002, 2005	2	1	1		0	0	0
	Udon Thani	2002	1	0	1		0	0	0
	Surat Thani	2002	1	0	1		0	0	0
	Lampang	1995, 2000, 2002, 2005	4	3	1	2000	1	1	0
	Ubon Ratchathani	2002	1	0	1		0	0	0
	Nakhon Phanom	2002	1	0	1		0	0	0
	Khon Kaen	1988, 1991, 1995, 2002, 2005	5	4	1		0	0	0
	Rayong	2002	1	0	1		0	0	0
	Lop Buri	2002	1	0	1		0	0	0
	Chiang Mai	1983-2002, 2005	21	20	1	1985, 2000	2	2	0
The Gambia	The Gambia National Cancer Registry	1988, 1992, 1997	3	2	1		0	0	0
Trinidad and Tobago	Trinidad and Tobago National Registry	1995-2006	12	0	12	1999-2006	8	0	8
Tunisia	Centre Sousse	2000	1	1	0		0	0	0
	North	2004	1	1	0		0	0	0
Turkey	Turkey Active Cancer Registration System	2007-2008	2	0	2		0	0	0
	Trabzon	2002-2006	5	1	4		0	0	0
	Edirne	2002-2005	4	0	4		0	0	0
	Antalya	2000, 2002-2005	5	1	4	2000	1	1	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Izmir	2000, 2002-2006	6	1	5	2000	1	1	0
	Samsun	2002-2005	4	0	4		0	0	0
	Eskisehir	2002-2005	4	0	4		0	0	0
	Erzurum	2002-2003, 2005	3	0	3		0	0	0
	Ankara	2002-2005	4	0	4		0	0	0
Uganda	Kyadondo County	1992, 1995, 2000, 2005	4	4	0		0	0	0
Ukraine	Ukraine National Registry	2000-2007, 2009-2010	10	1	9		0	0	0
United Kingdom	Scotland		0	0	0	1980, 1985, 1990, 1995, 2000	5	5	0
	North East England	1990-2010	21	0	21		0	0	0
	England South Thames		0	0	0	1969, 1975, 1980, 1985, 1990, 1995	6	6	0
	England North Western		0	0	0	1975, 1981, 1985, 1990, 1995, 2000	6	6	0
	Scotland East		0	0	0	1975, 1980, 1985	3	3	0
	England Merseyside and Cheshire		0	0	0	1980, 1985, 1990, 1995, 2000	5	5	0
	England East of England Region		0	0	0	2000	1	1	0
	Scotland Ayrshire		0	0	0	1971	1	1	0
	Scotland North-East		0	0	0	1975, 1980, 1985	3	3	0
	Wales	2006-2011	6	0	6		0	0	0
	South West England	1990-2010	21	0	21		0	0	0
	England Yorkshire		0	0	0	1985, 1990, 1995	3	3	0
	East Anglia		0	0	0	1990	1	1	0
	Northern Ireland		0	0	0	1995, 2000	2	2	0
	England Oxford Region		0	0	0	1970, 1976, 1981, 1985, 1990, 1995, 2000	7	7	0
	North West England	1990-2010	21	0	21		0	0	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	England and Wales Mersey Region		0	0	0	1976	1	1	0
	England		0	0	0	1995	1	1	0
	England Northern and Yorkshire		0	0	0	2000	1	1	0
	England East Midlands	1990-2010	21	0	21		0	0	0
	England Greater London	1990-2010	21	0	21		0	0	0
	Scotland South-East		0	0	0	1975, 1980, 1985	3	3	0
	Scotland West		0	0	0	1976, 1980, 1985, 1990	4	4	0
	England South and Western Regions		0	0	0	1968, 1980, 1985, 1990, 1995, 2000	6	6	0
	Scotland North		0	0	0	1975, 1980, 1985	3	3	0
	East of England	1990-2010	21	0	21		0	0	0
	England West Midlands	1990-2010	21	0	21	1970, 1981, 1990, 1995, 2000	5	5	0
	South East England	1990-2010	21	0	21		0	0	0
	England Wessex		0	0	0	1990	1	1	0
	England Thames		0	0	0	2000	1	1	0
	England and Wales		0	0	0	1981, 1985, 1989	3	3	0
	England Yorkshire and the Humber	1990-2010	21	0	21		0	0	0
	England Trent		0	0	0	1975, 1980, 1985, 1995, 2000	5	5	0
United States	Georgia Atlanta		0	0	0	1975-2007	33	1	33
	Alaska	1992-2008	17	0	17	1992-2007	16	0	16
	Texas El Paso		0	0	0	1969	1	1	0
	Massachusetts		0	0	0	2000	1	1	0
	Alabama		0	0	0	2000	1	1	0
	Iowa	1980-2008	29	0	29	1970, 1973-2007	36	3	35
	New York State		0	0	0	1995	1	1	0
	Washington Seattle		0	0	0	1974-2007	34	2	34
	Vermont		0	0	0	2000	1	1	0
	West Virginia		0	0	0	2000	1	1	0

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Florida		0	0	0	2000	1	1	0
	Rhode Island		0	0	0	2000	1	1	0
	Arizona		0	0	0	2000	1	1	0
	Seattle	1980-2008	29	0	29		0	0	0
	SEER (9 Registries)		0	0	0	1985, 1995, 2000	3	3	0
	San Francisco-Oakland SMSA	1980-2008	29	0	29	1973-2007	35	0	35
	South Carolina		0	0	0	2000	1	1	0
	New York City		0	0	0	1980, 1985	2	2	0
	New York State (less New York City)		0	0	0	1970, 1975, 1985	3	3	0
	District of Columbia		0	0	0	2000	1	1	0
	Oregon		0	0	0	2000	1	1	0
	California Los Angeles	1992-2008	17	0	17		0	0	0
	New Jersey	2000-2008	9	0	9	1995, 2000-2007	9	1	8
	Louisiana New Orleans		0	0	0	1976, 1980, 1985, 1990, 1995	5	5	0
	Illinois		0	0	0	2000	1	1	0
	Michigan Detroit		0	0	0	1970, 1973-2007	36	3	35
	Puerto Rico		0	0	0	1970, 1975, 1985, 1990, 1993	5	5	0
	California Central Valley		0	0	0	1990	1	1	0
	Central Louisiana		0	0	0	1990	1	1	0
	California Alameda County		0	0	0	1971, 1975, 1980, 1985	4	4	0
	Kentucky	2000-2008	9	0	9	2000-2007	8	0	8
	San Jose-Monterey	1992-2008	17	0	17	1992-2007	16	0	16
	Hawaii	1980-2008	29	0	29	1973-2007	35	2	35
	Louisiana	2000-2004, 2006-2008	8	0	8	2000-2004, 2006-2007	7	0	7
	Rural Georgia	1992-2008	17	0	17	1992-2007	16	0	16
	Washington		0	0	0	2000	1	1	0
	Atlanta	1980-2008	29	0	29		0	0	0
	Wisconsin		0	0	0	2000	1	1	0
	Texas		0	0	0	2000	1	1	0
	Connecticut	1980-2008	29	0	29	1970, 1973-2007	36	4	35
	New Mexico	1980-2008	29	0	29	1971, 1973-2007	36	2	35

eTable 1: Sources for cancer incidence and MI ratio data by country and registry

Country	Registry	Years available from the registry	Years used for incidence data	From CI5	Not from CI5	Years available for MI ratio data	Years used for MI ratio data	Direct MI ratios*	Generated MI ratios§
	Utah	1980-2008	29	0	29	1968, 1973-2007	36	3	35
	Detroit	1980-2008	29	0	29		0	0	0
	California Greater San Francisco Bay Area		0	0	0	1971, 1975, 1980, 1985, 1990, 1995	6	6	0
	California excluding SF/SJM/LA	2000-2008	9	0	9	2000-2007	8	0	8
	California Los Angeles County		0	0	0	1975, 1980, 1985, 1990, 1992-2007	20	4	16
Uruguay	Uruguay National Registry	2004, 2006	2	1	1		0	0	0
	Montevideo	1991, 1994	2	2	0	1991, 1994	2	2	0
Vietnam	Hanoi	1992, 1995	2	2	0		0	0	0
	Ho Chi Minh City	1996	1	1	0		0	0	0
Yugos-lavia	Vojvodina		0	0	0	1990, 1995	2	2	0
Zimbab-we	Bulawayo		0	0	0	1970	1	1	0
	Zimbabwe National Registry	2005-2006	2	0	2		0	0	0
	Harare	1991, 1995, 2000, 2004	4	4	0		0	0	0

CI5: Cancer incidence in five continents [1,2,4–10]; MI ratio: mortality to incidence ratio; *MI ratios are reported directly in some cancer registries and in CI5 to check for completeness of the registry data; §MI ratios were calculated using incident cases and deaths reported in registries.

eTable 2: Number of site years for cause of death data by source

Cause	Vital Registration	Verbal Autopsy	Cancer Registry*
Esophageal cancer	4896	51	3014
Stomach cancer	4913	58	3025
Liver cancer	4587	53	2997
Larynx cancer	4850	46	3022
Trachea, bronchus, and lung cancers	4906	53	3025
Breast cancer	4880	76	3030
Cervical cancer	4839	50	3025
Uterine cancer	4825	47	3014
Prostate cancer	4739	44	3025
Colon and rectum cancer	4896	54	3025
Lip and oral cavity cancer	4431	48	3008
Nasopharynx cancer	4515	43	2953
Cancer of other part of pharynx and oropharynx	4202	46	2959
Gallbladder and biliary tract cancer	4176	42	2977
Pancreatic cancer	4548	44	3023
Malignant skin melanoma	4565	41	3016
Ovarian cancer	4449	45	3025
Testicular cancer	4366	41	3006
Kidney and other urinary organ cancers	4180	43	3025
Bladder cancer	4533	42	3023
Brain and nervous system cancer	4521	51	3016
Thyroid cancer	4415	41	3024
Mesothelioma	4091	41	1945
Hodgkin lymphoma	4495	42	3013
Non-Hodgkin lymphoma	4203	44	3024
Multiple myeloma	4184	41	3009
Leukemia	4872	64	3013
Other neoplasms	4914	78	
*Cancer registry incidence data is transformed to mortality data by using MI ratios			

eTable 3: List of International Classification of Diseases (ICD) codes mapped to the Global Burden of Disease cause list for cancer

Cause	ICD-10 Code	ICD-9 Code
Esophageal cancer	C15-C15.9	150-150.9
Stomach cancer	C16-C16.9	151-151.9,209.23
Liver cancer	C22-C22.9	155-155.3
Larynx cancer	C32-C32.9	161-161.9,162.1
Tracheal, bronchus and lung cancers	C33-C34.9	162,162.0,162.2-162.9,209.21
Breast cancer	C50-C50.929	174-175.9
Cervical cancer	C53-C53.9	180-180.9
Uterine cancer	C54-C54.9	182-182.8
Prostate cancer	C61-C61.9	185-185.9
Colon and rectum cancer	C18-C20.0,C20.9-C21.8	153-154.9,155.5,155.9,209.1-209.17
Lip and oral cavity cancer	C00-C08.9	140-145.9
Nasopharynx cancer	C11-C11.9	147-147.9
Other pharynx cancer	C09-C10.9,C12-C13.9	146-146.9,148-148.9
Gallbladder and biliary tract cancer	C20.8,C23-C24.9	156-156.9,209.25-209.27
Pancreatic cancer	C25-C25.9	157-157.9
Malignant skin melanoma	C43-C43.9,C4A	172-172.9
Ovarian cancer	C56-C56.9	183,183.0
Testicular cancer	C62-C62.92	186-186.9
Kidney cancer	C64-C65.9	189.0,189.1,209.24
Bladder cancer	C67-C67.9	188-188.9
Brain and nervous system cancer	C70-C72.9	191-192.9
Thyroid cancer	C73-C73.9	193-193.9
Mesothelioma	C45-C45.9	158-158.9,163-163.3,163.8,163.9
Hodgkin lymphoma	C81-C81.99	201-201.98
Non-Hodgkin lymphoma	C82-C86.6,C96-C97.9	200-200.9,202-202.98
Multiple myeloma	C88-C90.32	203-203.9
Leukemia	C91-C95.92	204-208.92
Other neoplasms	C17-C17.9,C30-C31.9,C37-C38.8,C40-C41.9,C47-C49.9,C50.12-C50.129 ,C51-C52.9,C57-C57.8,C58,C58.0,C60-C60.9,C63-C63.8,C66-C66.9,C68.0-C68.8,C69-C69.92,C74-C75.8	152-152.9,160-160.9,164-164.9,170-171.9,181-181.9,182.9,183.2-183.8,184.0-184.4,184.8,187.1-187.8,189.2-189.8,190-190.9,194-194.8,

eTable 3: List of International Classification of Diseases (ICD) codes mapped to the Global Burden of Disease cause list for cancer

Cause	ICD-10 Code	ICD-9 Code
Other benign neoplasm	D07.1,D07.2,D07.4,D07.5,D09.2,D09.20,D09.21,D09.22,D10.7,D13.2,D13.3,D13.30,D13.39,D14.0,D15,D15.0,D15.1,D15.2,D15.7,D15.9,D16,D16.0,D16.00,D16.01,D16.02,D16.1,D16.10,D16.11,D16.12,D16.2,D16.20,D16.21,D16.22,D16.3,D16.30,D16.31,D16.32,D16.4,D16.5,D16.6,D16.7,D16.8,D16.9,D17.9,D18,D18.0,D18.00,D18.01,D18.02,D18.03,D18.09,D18.1,D19,D19.0,D19.1,D19.7,D19.9,D20,D20.0,D20.1,D20.9,D21,D21.0,D21.1,D21.10,D21.11,D21.12,D21.2,D21.20,D21.21,D21.22,D21.3,D21.4,D21.5,D21.6,D21.9,D28.0,D28.1,D28.2,D28.7,D29.0,D30.2,D30.20,D30.21,D30.22,D30.4,D30.7,D30.8,D31,D31.0,D31.00,D31.01,D31.02,D31.1,D31.10,D31.11,D31.12,D31.2,D31.20,D31.21,D31.22,D31.3,D31.30,D31.31,D31.32,D31.4,D31.40,D31.41,D31.42,D31.5,D31.50,D31.51,D31.52,D31.6,D31.60,D31.61,D31.62,D31.9,D31.90,D31.91,D31.92,D35,D35.0,D35.00,D35.01,D35.02,D35.1,D35.2,D35.3,D35.4,D35.5,D35.6,D35.7,D35.8,D35.9,D36,D36.1,D36.10,D36.11,D36.12,D36.13,D36.14,D36.15,D36.16,D36.17,D36.7,D37.2,D38.2,D38.3,D38.4,D38.5,D39.2,D39.7,D39.8,D41.2,D41.20,D41.21,D41.22,D41.3,D44.1,D44.10,D44.11,D44.12,D44.2,D44.3,D44.4,D44.5,D44.6,D44.7,D44.8,D45,D45.0,D45.9,D46,D46.0,D46.1,D46.2,D46.20,D46.21,D46.22,D46.3,D46.4,D46.5,D46.7,D46.9,D47,D47.3,D47.4,D47.5,D47.7,D48.0,D48.1,D48.2,D48.3,D48.4,D48.7,D49.81	209.4,209.40,209.41,209.42,209.43,211.2,211.8,212.0,212.4,212.5,212.6,212.7,212.8,213,213.0,213.1,213.2,213.3,213.4,213.5,213.6,213.7,213.8,213.9,214.2,214.3,214.4,214.8,214.9,221.0,221.1,221.2,221.8,222.1,222.8,223.2,223.8,223.81,223.89,224,224.0,224.1,224.2,224.3,224.4,224.5,224.6,224.7,224.8,224.9,227,227.0,227.1,227.3,227.4,227.5,227.6,227.8,227.9,228,228.0,228.00,228.01,228.02,228.03,228.04,228.09,228.1,228.9,229.0,229.8,230.7,230.8,233.31,233.32,233.4,233.5,234.0,234.5,234.8,235.4,235.8,236.1,236.99,238.0,238.1,238.4,238.5,238.6,238.7,238.71,238.72,238.73,238.74,238.75,238.76,238.77,238.79,238.8,239.2,623.0,623.1,623.7,210.8

eTable 4: Undefined cancer code categories (ICD-10) and respective target codes for cancer registry incidence data

Undefined site cancer codes	Target codes for redistribution
C14,C14.0-C14.3,C14.8	C00-C13.99
C26,C26.0,C26.1,C26.8,C26.9	C15.00-C25.99
C39,C39.0,C39.8,C39.9	C30.00- C38.99, C45.00-C45.99
C55,C55.1,C55.9	C53.00-C54.99
C57.9	C51.00-C54.99, C56.00-C58.99
C68.9	C64.00-C68.89
C63.9	C60.00-C63.89
C75.9	C73.00-C75.89
C76,C76.4,C76.5,C76.8,C77,C77.3-C77.5,C77.8,C77.9,C78,C79,C79.2-C79.9,C80,C80.0,C80.2	C00-C99 (Except any undefined site cancer codes)
C76.0,C76.1,C77.0,C77.1,C78.0-C78.3	C00-C13.99 ,C15, C30-C34.99,C37-C38.99, C40-C42.99, C43-C50.99, C69-C73.9
C76.2,C76.3,C77.2,C7.5,C78.4-C78.8,C79.0,C79.1	C15.00-C25.99, C45.00-C45.99, C48.00-C54.99, C56.00-C58.99 , C61, C63.00-C63.89, C64.00-C68.99, C74.00-C75.89, C81.00-C88.99

eTable 5: Countries within GBD regions

Region	Country
East Asia	China
	North Korea
	Taiwan
Southeast Asia	Cambodia
	Indonesia
	Laos
	Malaysia
	Maldives
	Myanmar
	Philippines
	Sri Lanka
	Thailand
	Timor-Leste
	Vietnam
Oceania	Fiji
	Kiribati
	Marshall Islands
	Federated States of Micronesia
	Papua New Guinea
	Samoa
	Solomon Islands
	Tonga
	Vanuatu
Central Asia	Armenia
	Azerbaijan
	Georgia
	Kazakhstan
	Kyrgyzstan
	Mongolia
	Tajikistan
	Turkmenistan
	Uzbekistan
Central Europe	Albania
	Bosnia and Herzegovina
	Bulgaria
	Croatia
	Czech Republic
	Hungary
	Macedonia
	Montenegro
	Poland
	Romania

	Serbia Slovakia Slovenia
Eastern Europe	Belarus Estonia Latvia Lithuania Moldova Russia Ukraine
High-income Asia Pacific	Brunei Japan South Korea Singapore
Australasia	Australia New Zealand
Western Europe	Andorra Austria Belgium Cyprus Denmark Finland France Germany Greece Iceland Ireland Israel Italy Luxembourg Malta Netherlands Norway Portugal Spain Sweden Switzerland United Kingdom
Southern Latin America	Argentina Chile Uruguay
High-income North America	Canada United States
Caribbean	Antigua and Barbuda

	The Bahamas Barbados Belize Cuba Dominica Dominican Republic Grenada Guyana Haiti Jamaica Saint Lucia Saint Vincent and the Grenadines Suriname Trinidad and Tobago
Andean Latin America	Bolivia Ecuador Peru
Central Latin America	Colombia Costa Rica El Salvador Guatemala Honduras Mexico Nicaragua Panama Venezuela
Tropical Latin America	Brazil Paraguay
North Africa and Middle East	Algeria Bahrain Egypt Iran Iraq Jordan Kuwait Lebanon Libya Morocco Palestine Oman Qatar Saudi Arabia Syria Tunisia

	Turkey United Arab Emirates Yemen Sudan
South Asia	Afghanistan Bangladesh Bhutan India Nepal Pakistan
Central Sub-Saharan Africa	Angola Central African Republic Congo Democratic Republic of the Congo Equatorial Guinea Gabon
Eastern Sub-Saharan Africa	Burundi Comoros Djibouti Eritrea Ethiopia Kenya Madagascar Malawi Mauritius Mozambique Rwanda Seychelles Somalia Tanzania Uganda Zambia South Sudan
Southern Sub-Saharan Africa	Botswana Lesotho Namibia South Africa Swaziland Zimbabwe
Western Sub-Saharan Africa	Benin Burkina Faso Cameroon Cape Verde Chad

	Cote d'Ivoire The Gambia Ghana Guinea Guinea-Bissau Liberia Mali Mauritania Niger Nigeria Sao Tome and Principe Senegal Sierra Leone Togo

eTable 6: Countries by development status

Developed	Developing	
Albania	Afghanistan	Madagascar
Andorra	Algeria	Malawi
Australia	Angola	Malaysia
Austria	Antigua and Barbuda	Maldives
Belarus	Argentina	Mali
Belgium	Armenia	Marshall Islands
Bosnia and Herzegovina	Azerbaijan	Mauritania
Brunei	Bahrain	Mauritius
Bulgaria	Bangladesh	Mexico
Canada	Barbados	Mongolia
Croatia	Belize	Morocco
Cyprus	Benin	Mozambique
Czech Republic	Bhutan	Myanmar
Denmark	Bolivia	Namibia
Estonia	Botswana	Nepal
Finland	Brazil	Nicaragua
France	Burkina Faso	Niger
Germany	Burundi	Nigeria
Greece	Cambodia	North Korea
Hungary	Cameroon	Oman
Iceland	Cape Verde	Pakistan
Ireland	Central African Republic	Palestine
Israel	Chad	Panama
Italy	Chile	Papua New Guinea
Japan	China	Paraguay
Latvia	Colombia	Peru
Lithuania	Comoros	Philippines
Luxembourg	Congo	Qatar
Macedonia	Costa Rica	Rwanda
Malta	Cote d'Ivoire	Saint Lucia
Moldova	Cuba	Saint Vincent and the Grenadines
Montenegro	Democratic Republic of the Congo	Samoa
Netherlands	Djibouti	Sao Tome and Principe
New Zealand	Dominica	Saudi Arabia
Norway	Dominican Republic	Senegal
Poland	Ecuador	Seychelles
Portugal	Egypt	Sierra Leone
Romania	El Salvador	Solomon Islands
Russia	Equatorial Guinea	Somalia
Serbia	Eritrea	South Africa
Singapore	Ethiopia	South Sudan
Slovakia	Federated States of Micronesia	Sri Lanka
Slovenia	Fiji	Sudan
South Korea	Gabon	Suriname

eTable 6: Countries by development status

Developed	Developing	
Spain	Georgia	Swaziland
Sweden	Ghana	Syria
Switzerland	Grenada	Taiwan
Ukraine	Guatemala	Tajikistan
United Kingdom	Guinea	Tanzania
United States	Guinea-Bissau	Thailand
	Guyana	The Bahamas
	Haiti	The Gambia
	Honduras	Timor-Leste
	India	Togo
	Indonesia	Tonga
	Iran	Trinidad and Tobago
	Iraq	Tunisia
	Jamaica	Turkey
	Jordan	Turkmenistan
	Kazakhstan	Uganda
	Kenya	United Arab Emirates
	Kiribati	Uruguay
	Kuwait	Uzbekistan
	Kyrgyzstan	Vanuatu
	Laos	Venezuela
	Lebanon	Vietnam
	Lesotho	Yemen
	Liberia	Zambia
	Libya	Zimbabwe

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
Asia Pacific, High Income	15 - 49	regression result	0.029	0.174	0.000	0.017	0.075	0.031	0.579	0.072	0.023
Asia Pacific, High Income	15 - 49	proportional redistribution	0.002	0.132	0.210	0.069	0.032	0.097	0.257	0.082	0.118
Asia Pacific, High Income	50 - 69	regression result	0.097	0.000	0.066	0.011	0.000	0.027	0.799	0.000	0.000
Asia Pacific, High Income	50 - 69	proportional redistribution	0.003	0.076	0.151	0.088	0.053	0.114	0.108	0.150	0.256
Asia Pacific, High Income	70+	regression result	0.058	0.129	0.056	0.048	0.026	0.066	0.501	0.043	0.073
Asia Pacific, High Income	70+	proportional redistribution	0.007	0.059	0.158	0.130	0.046	0.155	0.060	0.133	0.251
Asia, Central	15 - 49	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
Asia, Central	15 - 49	proportional redistribution	0.073	0.091	0.102	0.047	0.047	0.190	0.228	0.143	0.079
Asia, Central	50 - 69	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
Asia, Central	50 - 69	proportional redistribution	0.095	0.095	0.113	0.036	0.059	0.181	0.107	0.159	0.156
Asia, Central	70+	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
Asia, Central	70+	proportional redistribution	0.201	0.076	0.079	0.030	0.051	0.198	0.071	0.147	0.147
Asia, East	15 - 49	regression result	0.046	0.281	0.000	0.028	0.122	0.049	0.306	0.119	0.049
Asia, East	15 - 49	proportional redistribution	0.002	0.084	0.027	0.007	0.004	0.126	0.634	0.043	0.074
Asia, East	50 - 69	regression result	0.000	0.532	0.110	0.061	0.000	0.043	0.000	0.253	0.001

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
Asia, East	50 - 69	proportional redistribution	0.002	0.068	0.040	0.011	0.012	0.126	0.583	0.051	0.105
Asia, East	70+	regression result	0.090	0.233	0.088	0.102	0.042	0.105	0.157	0.067	0.116
Asia, East	70+	proportional redistribution	0.006	0.057	0.078	0.021	0.024	0.145	0.469	0.062	0.138
Asia, Southeast	15 - 49	regression result	0.034	0.232	0.064	0.022	0.100	0.041	0.359	0.089	0.059
Asia, Southeast	15 - 49	proportional redistribution	0.008	0.038	0.136	0.020	0.008	0.165	0.553	0.059	0.012
Asia, Southeast	50 - 69	regression result	0.018	0.268	0.060	0.000	0.072	0.020	0.372	0.062	0.128
Asia, Southeast	50 - 69	proportional redistribution	0.005	0.056	0.175	0.028	0.011	0.230	0.400	0.071	0.025
Asia, Southeast	70+	regression result	0.076	0.251	0.066	0.242	0.021	0.088	0.103	0.056	0.097
Asia, Southeast	70+	proportional redistribution	0.012	0.064	0.210	0.041	0.013	0.313	0.231	0.091	0.025
Australasia	15 - 49	regression result	0.061	0.388	0.000	0.039	0.168	0.068	0.000	0.189	0.087
Australasia	15 - 49	proportional redistribution	0.032	0.146	0.161	0.018	0.068	0.093	0.237	0.179	0.065
Australasia	50 - 69	regression result	0.000	0.370	0.095	0.016	0.013	0.040	0.000	0.466	0.000
Australasia	50 - 69	proportional redistribution	0.019	0.183	0.129	0.016	0.091	0.113	0.093	0.224	0.131
Australasia	70+	regression result	0.093	0.258	0.082	0.062	0.028	0.105	0.187	0.067	0.117
Australasia	70+	proportional redistribution	0.036	0.147	0.181	0.022	0.065	0.175	0.073	0.178	0.124

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
Caribbean	15 - 49	regression result	0.029	0.175	0.000	0.017	0.076	0.031	0.565	0.076	0.032
Caribbean	15 - 49	proportional redistribution	0.009	0.216	0.112	0.018	0.048	0.198	0.177	0.187	0.036
Caribbean	50 - 69	regression result	0.026	0.257	0.037	0.033	0.000	0.023	0.390	0.091	0.142
Caribbean	50 - 69	proportional redistribution	0.006	0.217	0.133	0.008	0.042	0.225	0.098	0.208	0.064
Caribbean	70+	regression result	0.084	0.202	0.087	0.090	0.043	0.097	0.227	0.062	0.108
Caribbean	70+	proportional redistribution	0.027	0.212	0.135	0.015	0.024	0.318	0.062	0.162	0.046
Europe, Central	15 - 49	regression result	0.059	0.278	0.000	0.027	0.120	0.049	0.258	0.137	0.072
Europe, Central	15 - 49	proportional redistribution	0.015	0.174	0.121	0.017	0.114	0.085	0.063	0.230	0.181
Europe, Central	50 - 69	regression result	0.000	0.463	0.065	0.005	0.066	0.022	0.000	0.354	0.026
Europe, Central	50 - 69	proportional redistribution	0.032	0.148	0.130	0.018	0.105	0.102	0.051	0.227	0.188
Europe, Central	70+	regression result	0.117	0.375	0.095	0.082	0.007	0.118	0.000	0.076	0.131
Europe, Central	70+	proportional redistribution	0.163	0.110	0.119	0.021	0.069	0.157	0.060	0.160	0.141
Europe, Eastern	15 - 49	regression result	0.053	0.315	0.000	0.031	0.136	0.055	0.220	0.129	0.060
Europe, Eastern	15 - 49	proportional redistribution	0.022	0.111	0.122	0.006	0.109	0.169	0.110	0.222	0.130
Europe, Eastern	50 - 69	regression result	0.000	0.205	0.109	0.052	0.000	0.042	0.424	0.168	0.000

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
Europe, Eastern	50 - 69	proportional redistribution	0.046	0.107	0.118	0.014	0.092	0.156	0.055	0.230	0.183
Europe, Eastern	70+	regression result	0.107	0.287	0.100	0.000	0.030	0.121	0.144	0.077	0.134
Europe, Eastern	70+	proportional redistribution	0.200	0.060	0.118	0.019	0.059	0.205	0.050	0.149	0.139
Europe, Western	15 - 49	regression result	0.020	0.303	0.087	0.033	0.131	0.053	0.251	0.120	0.001
Europe, Western	15 - 49	proportional redistribution	0.006	0.193	0.070	0.010	0.112	0.104	0.089	0.234	0.183
Europe, Western	50 - 69	regression result	0.011	0.111	0.120	0.164	0.167	0.033	0.267	0.053	0.075
Europe, Western	50 - 69	proportional redistribution	0.012	0.186	0.073	0.010	0.111	0.115	0.055	0.235	0.204
Europe, Western	70+	regression result	0.074	0.091	0.107	0.163	0.092	0.102	0.192	0.066	0.114
Europe, Western	70+	proportional redistribution	0.055	0.178	0.122	0.019	0.078	0.171	0.054	0.172	0.151
Global	15 - 49	regression result	0.021	0.220	0.000	0.018	0.123	0.000	0.383	0.152	0.082
Global	15 - 49	proportional redistribution	0.010	0.165	0.116	0.017	0.078	0.131	0.142	0.212	0.130
Global	50 - 69	regression result	0.065	0.121	0.033	0.033	0.071	0.000	0.319	0.166	0.193
Global	50 - 69	proportional redistribution	0.014	0.160	0.113	0.020	0.083	0.142	0.077	0.223	0.169
Global	70+	regression result	0.202	0.107	0.076	0.077	0.082	0.000	0.179	0.110	0.167
Global	70+	proportional redistribution	0.048	0.144	0.144	0.036	0.058	0.199	0.065	0.167	0.139

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
Latin America, Andean	15 - 49	regression result	0.009	0.055	0.000	0.183	0.183	0.183	0.183	0.023	0.183
Latin America, Andean	15 - 49	proportional redistribution	0.019	0.032	0.335	0.057	0.038	0.267	0.089	0.139	0.025
Latin America, Andean	50 - 69	regression result	0.006	0.030	0.020	0.213	0.213	0.213	0.066	0.026	0.213
Latin America, Andean	50 - 69	proportional redistribution	0.021	0.012	0.292	0.024	0.046	0.315	0.064	0.174	0.052
Latin America, Andean	70+	regression result	0.023	0.044	0.021	0.209	0.209	0.209	0.059	0.018	0.209
Latin America, Andean	70+	proportional redistribution	0.033	0.031	0.246	0.040	0.068	0.362	0.076	0.102	0.043
Latin America, Central	15 - 49	regression result	0.063	0.315	0.064	0.030	0.137	0.055	0.168	0.123	0.044
Latin America, Central	15 - 49	proportional redistribution	0.036	0.111	0.203	0.043	0.033	0.239	0.177	0.117	0.042
Latin America, Central	50 - 69	regression result	0.011	0.346	0.134	0.039	0.100	0.056	0.037	0.144	0.133
Latin America, Central	50 - 69	proportional redistribution	0.019	0.136	0.197	0.031	0.058	0.249	0.081	0.151	0.078

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
Latin America, Central	70+	regression result	0.095	0.287	0.094	0.076	0.045	0.123	0.063	0.079	0.137
Latin America, Central	70+	proportional redistribution	0.039	0.136	0.193	0.032	0.044	0.312	0.049	0.127	0.068
Latin America, Southern	15 - 49	regression result	0.029	0.173	0.000	0.017	0.075	0.030	0.578	0.070	0.027
Latin America, Southern	15 - 49	proportional redistribution	0.015	0.096	0.218	0.010	0.127	0.229	0.115	0.157	0.032
Latin America, Southern	50 - 69	regression result	0.000	0.163	0.075	0.047	0.000	0.028	0.567	0.119	0.000
Latin America, Southern	50 - 69	proportional redistribution	0.016	0.110	0.216	0.007	0.134	0.225	0.056	0.177	0.059
Latin America, Southern	70+	regression result	0.086	0.207	0.082	0.100	0.040	0.100	0.211	0.064	0.111
Latin America, Southern	70+	proportional redistribution	0.043	0.082	0.192	0.010	0.097	0.329	0.055	0.126	0.066
Latin America, Tropical	15 - 49	regression result	0.029	0.170	0.018	0.017	0.074	0.030	0.566	0.069	0.028
Latin America, Tropical	15 - 49	proportional redistribution	0.009	0.157	0.118	0.009	0.040	0.202	0.058	0.315	0.091

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
Latin America, Tropical	50 - 69	regression result	0.040	0.165	0.066	0.053	0.076	0.023	0.512	0.004	0.060
Latin America, Tropical	50 - 69	proportional redistribution	0.009	0.152	0.116	0.009	0.037	0.210	0.031	0.321	0.115
Latin America, Tropical	70+	regression result	0.080	0.206	0.081	0.100	0.047	0.091	0.236	0.058	0.101
Latin America, Tropical	70+	proportional redistribution	0.030	0.131	0.121	0.014	0.030	0.270	0.032	0.284	0.089
North Africa / Middle East	15 - 49	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
North Africa / Middle East	15 - 49	proportional redistribution	0.032	0.043	0.091	0.023	0.050	0.279	0.238	0.167	0.076
North Africa / Middle East	50 - 69	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
North Africa / Middle East	50 - 69	proportional redistribution	0.046	0.052	0.081	0.022	0.047	0.299	0.192	0.190	0.072
North Africa / Middle East	70+	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
North Africa / Middle East	70+	proportional redistribution	0.065	0.036	0.088	0.031	0.044	0.326	0.166	0.174	0.068
North America, High Income	15 - 49	regression result	0.031	0.181	0.000	0.018	0.078	0.032	0.550	0.075	0.035
North America, High Income	15 - 49	proportional redistribution	0.010	0.188	0.150	0.012	0.041	0.147	0.202	0.197	0.053

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
North America, High Income	50 - 69	regression result	0.071	0.173	0.106	0.079	0.121	0.041	0.102	0.101	0.205
North America, High Income	50 - 69	proportional redistribution	0.010	0.196	0.141	0.011	0.049	0.181	0.101	0.219	0.092
North America, High Income	70+	regression result	0.091	0.221	0.083	0.107	0.045	0.102	0.173	0.065	0.113
North America, High Income	70+	proportional redistribution	0.029	0.174	0.177	0.020	0.036	0.244	0.078	0.163	0.080
Oceania	15 - 49	regression result	0.136	0.041	0.136	0.004	0.136	0.136	0.136	0.136	0.136
Oceania	15 - 49	proportional redistribution		1.000	0.000	0.000		0.000	0.000	0.000	
Oceania	50 - 69	regression result	0.142	0.000	0.142	0.009	0.142	0.142	0.142	0.142	0.142
Oceania	50 - 69	proportional redistribution		0.222	0.222	0.000		0.222	0.333	0.000	
Oceania	70+	regression result	0.135	0.039	0.135	0.018	0.135	0.135	0.135	0.135	0.135
Oceania	70+	proportional redistribution		0.167	0.167	0.167		0.333	0.000	0.167	
Sub-Saharan Africa, Southern	15 - 49	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
Sub-Saharan Africa, Southern	15 - 49	proportional redistribution	0.014	0.008	0.320	0.033	0.090	0.266	0.113	0.107	0.048

eTable 7: Results of regression analysis for undefined malignant neoplasms of the lip, oral cavity and pharynx (C14) by age group and region, male

Region	Age (years)	Re-distribution method	Lip and oral cavity cancer			Nasopharynx cancer			Other pharynx cancer		
			Malignant neoplasm of lip	Malignant neoplasm of tongue	Malignant neoplasm of major salivary glands	Malignant neoplasm of gum	Malignant neoplasm of floor of mouth	Malignant neoplasm of other and unspecified parts of mouth	Malignant neoplasm of nasopharynx	Malignant neoplasm of oropharynx	Malignant neoplasm of hypo-pharynx
Sub-Saharan Africa, Southern	50 - 69	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
Sub-Saharan Africa, Southern	50 - 69	proportional redistribution	0.010	0.010	0.326	0.019	0.123	0.274	0.058	0.116	0.064
Sub-Saharan Africa, Southern	70+	regression result	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
Sub-Saharan Africa, Southern	70+	proportional redistribution	0.016	0.010	0.306	0.034	0.104	0.317	0.061	0.100	0.050

eTable 8: Carcinoma in situ, neoplasm of uncertain behavior and benign neoplasm assigned to GBD cancer in CoD redistribution

Cause	ICD-10 Code	ICD-9 Code
Esophageal cancer	D00.1, D13.0	211.0, 230.1
Stomach cancer	D00.2, D13.1, D37.1	211.1, 230.2
Liver cancer	D13.4,	211.5
Larynx cancer	D02.0, D14.1, D38.0	212.1, 231.0, 235.6
Tracheal, bronchus and lung cancer	D02.1, D02.2, D02.20, D02.21, D02.22, D02.3, D14.2, D14.3, D14.30, D14.31, D14.32, D38.1	209.61, 212.2, 212.3, 231.1, 231.2, 235.7
Breast cancer	D05, D05.0, D05.00, D05.01, D05.02, D05.1, D05.10, D05.11, D05.12, D05.7, D05.8, D05.80, D05.81, D05.82, D05.9, D05.90, D05.91, D05.92, D24, D24.0, D24.1, D24.2, D24.9, D48.6, D48.60, D48.61, D48.62, D49.3	217, 217.0, 217.8, 233.0, 238.3, 239.3, 610, 610.0, 610.1, 610.2, 610.3, 610.4, 610.8, 610.9
Cervical cancer	D06, D06.0, D06.1, D06.7, D06.9, D26.0, D26.1	219.0, 219.1, 233.1
Uterine cancer	D25, D25.0, D25.1, D25.2, D25.9	218, 218.0, 218.1, 218.2, 218.9, 233.2
Prostate cancer	D29.1, D40.0	222.2, 236.5
Colon and rectum cancer	D01.0, D01.1, D01.2, D01.3, D12, D12.0, D12.1, D12.2, D12.3, D12.4, D12.5, D12.6, D12.7, D12.8, D12.9, D37.3, D37.4, D37.5	569.0, 569.43, 569.44, 569.84, 569.85 , 209.5, 209.50, 209.51, 209.52, 209.53, 209.54, 209.55, 209.56, 209.57, 211.3, 211.4, 230.3, 230.4, 230.5, 230.6
Lip and oral cavity cancer	D00.00, D00.01, D00.02, D00.03, D00.04, D00.05, D00.06, D00.07, D10.0, D10.1, D10.2, D10.3, D10.30, D10.39, D10.4, D10.5, D11, D11.0, D11.7, D11.9, D37.01, D37.02, D37.03, D37.030, D37.031, D37.032, D37.039, D37.04, D37.09	210.0, 210.1, 210.2, 210.3, 210.4, 210.5, 210.6, 235.0
Nasopharynx cancer	D00.08, D10.6, D37.05	210.7, 210.9, 210.8
Other pharynx cancer	D10.7	
Gallbladder and biliary tract cancer	D13.5	209.65, 209.66, 209.67
Pancreatic cancer	D13.6, D13.7	211.6, 211.7
Malignant skin melanoma	D03, D03.0, D03.1, D03.10, D03.11, D03.12, D03.2, D03.20, D03.21, D03.22, D03.3, D03.30, D03.39, D03.4, D03.5, D03.51, D03.52, D03.59, D03.6, D03.60, D03.61, D03.62, D03.7, D03.70, D03.71, D03.72, D03.8, D03.9, D22, D22.0, D22.1, D22.10, D22.11, D22.12, D22.2, D22.20, D22.21, D22.22, D22.3, D22.30, D22.39, D22.4, D22.5, D22.6, D22.60, D22.61, D22.62, D22.7, D22.70, D22.71, D22.72, D22.9, D23, D23.0, D23.1, D23.10, D23.11, D23.12, D23.2, D23.20, D23.21, D23.22, D23.3, D23.30, D23.39, D23.4, D23.5, D23.6, D23.60, D23.61, D23.62, D23.7, D23.70, D23.71, D23.72, D23.9, D48.5	232, 232.0, 232.1, 232.2, 232.3, 232.4, 232.5, 232.6, 232.7, 232.8, 232.9, 238.2

eTable 8: Carcinoma in situ, neoplasm of uncertain behavior and benign neoplasm assigned to GBD cancer in CoD redistribution

Cause	ICD-10 Code	ICD-9 Code
Ovarian cancer	D27, D27.0, D27.1, D27.9, D39.1, D39.10, D39.11, D39.12	236.2
Testicular cancer	D29.2, D29.20, D29.21, D29.22, D29.3, D29.30, D29.31, D29.32, D29.4, D29.7, D29.8, D40.1, D40.10, D40.11, D40.12, D40.7, D40.8	222.0, 222.3, 236.4
Kidney cancer	D30.0, D30.00, D30.01, D30.02, D30.1, D30.10, D30.11, D30.12, D41.0, D41.00, D41.01, D41.02, D41.1, D41.10, D41.11, D41.12	209.64, 223.0, 223.1, 236.91
Bladder cancer	D09.0, D30.3, D41.4, D41 .7, D41.8, D49.4	223.3, 233.7, 236.7, 239.4
Thyroid cancer	D09.3, D09.7, D09.8, D34, D34.0, D34.9, D44.0	226, 226.0, 226.9
Mesothelioma		212.4
Other neoplasms	D07.4, D09.2, D13.2, D13.3, D14.0, D15, D15.0, D15.1, D15.2, D15.7, D15.9, D16, D16.0, D16.1, D16.2, D16.3, D16.4, D16.5, D16.6, D16.7, D16.8, D16.9, D28.0, D28.1, D28.7, D29.0, D30.2, D30.4, D30.7, D30.8, D31, D31.0, D31.1, D31.2, D31.3, D31.4, D31.5, D31.6, D31.9, D35, D35.0, D35.1, D35.2, D35.3, D35.4, D35.5, D35.6, D35.7, D35.8, D35.9, D36, D36.1, D36.7, D37.2, D38.2, D38.3, D38.4, D38.5, D39.2, D39.8, D41.2, D41.3, D44.1, D44.2, D44.3, D44.4, D44.5, D44.6, D44.7, D44.8, D47, D47.0, D47.1, D47.2, D47.3, D47.4, D47.5, D47.7, D47.9, D48.0, D48.1, D48.2, D48.3, D48.4, D32, D32.0, D32.1, D32.9, D33, D33.0, D33.1, D33.2, D33.3, D33.4, D33.7, D33.9, D42, D42.0, D42.1, D42.9, D43, D43.0, D43.1D43.2, D43.3, D43.4, D43.7, D43.8, D43.9, D45, D45.0, D45.9, D46, D46.0, D46.1, D46.2, D46.3, D46.4, D46.5, D46.7, D46.9D49.6, K31.7, K62.0, K62.1, K63.5, N84.0, N84.1	194, 194.0, 194.1, 194.3, 194.4, 194.5, 194.6, 194.8, 209.0, 209.4, 211.2, 211.8, 212.0, 212.5, 212.6, 212.7, 212.8, 213, 213.0, 213.1, 213.2, 213.3, 213.4, 213.5, 213.6, 213.7, 213.8, 213.9, 221.02, 21.1, 221.2, 221.8, 222.1, 222.8, 223.2, 223.8, 224, 224.0, 224.1, 224.2, 224.3, 224.4, 224.5, 224.6, 224.7, 224.8, 224.9, 227, 227.0, 227.1, 227.3, 227.4, 227.5, 227.6, 227.8, 227.9, 228, 228.0, 228.1, 228.9, 229.0, 229.8, 230.7, 230.8, 233.4, 233.5, 234.0, 234.5, 234.8, 235.4, 235.8, 236.1, 238.0, 238.1, 239.2, 225, 225.0, 225.1, 225.2, 225.3, 225.4, 225.8, 225.9, 237, 237.0, 237.1, 237.2, 237.3, 237.4, 237.5, 237.6, 237.7, 237.9, 238.4238.5, 238.6, 238.7, 238.8, 239.6, 569.0

eTable 9: Increase in mortality after redistributing benign, in situ neoplasms or neoplasms of uncertain behavior to respective cancer by different years and ICD coding system

Cause	Relative increase [%]						
	1990	1995		2000		2005	2010
	ICD-9	ICD-9	ICD-10	ICD-9	ICD-10	ICD-10	ICD-10
Esophageal cancer	0	0	4	0	2	3	1
Stomach cancer	31	43	3	58	3	5	5
Liver cancer	0	0	2	0	2	2	1
Larynx cancer	13	12	3	13	1	2	2
Tracheal, bronchus and lung cancer	7	7	1	8	0	0	0
Breast cancer	7	8	1	9	0	0	1
Cervical cancer	10	14	7	16	6	9	4
Uterine cancer	14	14	16	12	6	8	1
Prostate cancer	2	2	1	2	0	1	1
Colon and rectum cancer	20	22	1	25	1	1	3
Lip and oral cavity cancer	34	34	2	33	1	2	4
Nasopharynx cancer	115	116	3	117	3	6	3
Other pharynx cancer	56	52	7	58	4	5	8
Gallbladder and biliary tract cancer	120	175	3	208	3	4	15
Pancreatic cancer	19	20	1	20	0	1	1
Malignant skin melanoma	26	24	1	22	0	0	0
Ovarian cancer	8	8	1	8	0	1	1
Testicular cancer	7	11	5	13	5	10	11
Kidney cancer	26	24	2	24	1	1	1
Bladder cancer	11	12	3	13	1	1	0
Brain and nervous system cancer	7	6	0	6	0	0	1
Thyroid cancer	30	35	2	39	2	3	5
Mesothelioma	18	14	11	13	2	4	5
Hodgkin lymphoma	0	0	5	0	5	8	7
Non-Hodgkin lymphoma	0	0	1	0	1	2	6

eTable 9: Increase in mortality after redistributing benign, in situ neoplasms or neoplasms of uncertain behavior to respective cancer by different years and ICD coding system

Cause	Relative increase [%]						
	1990	1995		2000		2005	2010
	ICD-9	ICD-9	ICD-10	ICD-9	ICD-10	ICD-10	ICD-10
Multiple myeloma	0	0	1	0	0	0	0
Leukemia	0	0	0	0	0	0	1
Other neoplasms	20	23	2	22	2	2	3

eTable 10: Increase in mortality estimates for the year 2008 after redistribution of different categories of garbage code for all countries using ICD-10 in 2008

	Increase from ill-defined codes for CoD	Increase from intermediate causes of death	Increase from deaths assigned to the symptoms	Increase from deaths assigned to unspecified cancer sites	Total increase
Uterine cancer	2.5%	1.1%	0.4%	32.9%	36.9%
Nasopharynx cancer	3.0%	1.2%	0.2%	30.4%	34.7%
Cervical cancer	3.3%	1.0%	0.3%	28.8%	33.4%
Other pharynx cancer	3.2%	1.0%	0.8%	21.1%	26.2%
Stomach cancer	4.0%	1.1%	3.0%	14.7%	22.8%
Lip and oral cavity cancer	3.8%	1.0%	0.2%	15.5%	20.5%
Gallbladder cancer	4.6%	2.4%	0.2%	13.0%	20.2%
Kidney cancer	3.0%	1.1%	0.3%	14.2%	18.6%
Other cancer	3.8%	1.3%	3.4%	8.9%	17.4%
Colon and rectum cancer	3.5%	1.1%	2.6%	9.8%	17.0%
Mesothelioma	2.4%	0.9%	0.2%	13.1%	16.6%
Hodgkin lymphoma	3.9%	2.0%	1.1%	7.0%	13.9%
Malignant skin melanoma	3.1%	0.9%	0.2%	9.3%	13.5%
Ovarian cancer	3.1%	1.0%	0.3%	8.9%	13.2%
Testicular cancer	4.7%	1.2%	0.4%	6.2%	12.5%
Pancreatic cancer	3.5%	1.0%	0.2%	7.2%	12.0%
Thyroid cancer	4.7%	1.1%	0.2%	4.7%	10.8%
Prostate cancer	4.0%	1.0%	0.2%	5.3%	10.4%
Bladder cancer	4.1%	1.3%	0.2%	4.3%	9.9%
Tracheal, bronchus and lung cancer	3.3%	1.2%	0.6%	4.8%	9.8%

eTable 10: Increase in mortality estimates for the year 2008 after redistribution of different categories of garbage code for all countries using ICD-10 in 2008

	Increase from ill-defined codes for CoD	Increase from intermediate causes of death	Increase from deaths assigned to the symptoms	Increase from deaths assigned to unspecified cancer sites	Total increase
Esophageal cancer	4.0%	1.2%	0.2%	4.4%	9.8%
Liver cancer	4.4%	1.5%	0.2%	2.3%	8.5%
Breast cancer	3.5%	1.0%	0.3%	3.4%	8.2%
Larynx cancer	4.3%	0.1%	0.8%	2.7%	7.9%
Non-Hodgkin lymphoma	3.4%	1.2%	0.5%	2.8%	7.9%
Brain and nervous system cancer	4.2%	0.6%	0.7%	2.0%	7.5%
Leukemia	3.8%	1.8%	0.4%	0.8%	6.8%
Multiple myeloma	3.3%	1.8%	0.2%	1.2%	6.5%

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Esophageal cancer	Females	Alcohol (liters per capita)	1	Positive
Esophageal cancer	Females	Cumulative Cigarettes (15 Years)	1	Positive
Esophageal cancer	Females	Cumulative Cigarettes (20 Years)	1	Positive
Esophageal cancer	Females	Fruits (kcal per capita)	1	Negative
Esophageal cancer	Females	Mean BMI	1	Positive
Esophageal cancer	Females	Smoking Prevalence [lagged 10 years]	1	Positive
Esophageal cancer	Females	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Esophageal cancer	Females	Improved Water Source (proportion with access)	2	Negative
Esophageal cancer	Females	Indoor Air Pollution (All Cooking Fuels)	2	Positive
Esophageal cancer	Females	Indoor Air Pollution (Biomass Cooking)	2	Positive
Esophageal cancer	Females	Indoor Air Pollution (Coal Cooking)	2	Positive
Esophageal cancer	Females	Outdoor Air Pollution (PM2.5)	2	Positive
Esophageal cancer	Females	Sanitation (proportion with access)	2	Negative
Esophageal cancer	Females	Total Calories (kcal per capita)	2	Positive
Esophageal cancer	Females	Vegetables (kcal per capita)	2	Negative
Esophageal cancer	Females	Education (years per capita)	3	Negative
Esophageal cancer	Females	LDI (I$ per capita)	3	Negative
Esophageal cancer	Males	Alcohol (liters per capita)	1	Positive
Esophageal cancer	Males	Cumulative Cigarettes (15 Years)	1	Positive
Esophageal cancer	Males	Cumulative Cigarettes (20 Years)	1	Positive
Esophageal cancer	Males	Fruits (kcal per capita)	1	Negative
Esophageal cancer	Males	Mean BMI	1	Positive
Esophageal cancer	Males	Smoking Prevalence [lagged 10 years]	1	Positive
Esophageal cancer	Males	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Esophageal cancer	Males	Improved Water Source (proportion with access)	2	Negative
Esophageal cancer	Males	Indoor Air Pollution (All Cooking Fuels)	2	Positive
Esophageal cancer	Males	Indoor Air Pollution (Biomass Cooking)	2	Positive
Esophageal cancer	Males	Indoor Air Pollution (Coal Cooking)	2	Positive
Esophageal cancer	Males	Outdoor Air Pollution (PM2.5)	2	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Esophageal cancer	Males	Sanitation (proportion with access)	2	Negative
Esophageal cancer	Males	Total Calories (kcal per capita)	2	Positive
Esophageal cancer	Males	Vegetables (kcal per capita)	2	Negative
Esophageal cancer	Males	Education (years per capita)	3	Negative
Esophageal cancer	Males	LDI (I$ per capita)	3	Negative
Stomach cancer	Females	Cumulative Cigarettes (10 Years)	1	Positive
Stomach cancer	Females	Cumulative Cigarettes (15 Years)	1	Positive
Stomach cancer	Females	Cumulative Cigarettes (20 Years)	1	Positive
Stomach cancer	Females	Smoking Prevalence [lagged 10 years]	1	Positive
Stomach cancer	Females	Tobacco (cigarettes per capita)	1	Positive
Stomach cancer	Females	Alcohol (liters per capita)	2	Positive
Stomach cancer	Females	Fruits (kcal per capita)	2	Negative
Stomach cancer	Females	Improved Water Source (proportion with access)	2	Negative
Stomach cancer	Females	Indoor Air Pollution (All Cooking Fuels)	2	Positive
Stomach cancer	Females	Indoor Air Pollution (Biomass Cooking)	2	Positive
Stomach cancer	Females	Indoor Air Pollution (Coal Cooking)	2	Positive
Stomach cancer	Females	Mean BMI	2	Positive
Stomach cancer	Females	Outdoor Air Pollution (PM2.5)	2	Positive
Stomach cancer	Females	Sanitation (proportion with access)	2	Negative
Stomach cancer	Females	Vegetables (kcal per capita)	2	Negative
Stomach cancer	Females	Education (years per capita)	3	Negative
Stomach cancer	Females	LDI (I$ per capita)	3	Negative
Stomach cancer	Males	Cumulative Cigarettes (10 Years)	1	Positive
Stomach cancer	Males	Cumulative Cigarettes (15 Years)	1	Positive
Stomach cancer	Males	Cumulative Cigarettes (20 Years)	1	Positive
Stomach cancer	Males	Smoking Prevalence [lagged 10 years]	1	Positive
Stomach cancer	Males	Tobacco (cigarettes per capita)	1	Positive
Stomach cancer	Males	Alcohol (liters per capita)	2	Positive
Stomach cancer	Males	Fruits (kcal per capita)	2	Negative

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Stomach cancer	Males	Improved Water Source (proportion with access)	2	Negative
Stomach cancer	Males	Indoor Air Pollution (All Cooking Fuels)	2	Positive
Stomach cancer	Males	Indoor Air Pollution (Biomass Cooking)	2	Positive
Stomach cancer	Males	Indoor Air Pollution (Coal Cooking)	2	Positive
Stomach cancer	Males	Mean BMI	2	Positive
Stomach cancer	Males	Outdoor Air Pollution (PM2.5)	2	Positive
Stomach cancer	Males	Red Meat (kcal per capita)	2	Positive
Stomach cancer	Males	Sanitation (proportion with access)	2	Negative
Stomach cancer	Males	Vegetables (kcal per capita)	2	Negative
Stomach cancer	Males	Education (years per capita)	3	Negative
Stomach cancer	Males	LDI (I$ per capita)	3	Negative
Liver cancer	Females	Alcohol (liters per capita)	1	Positive
Liver cancer	Females	Cumulative Cigarettes (15 Years)	1	Positive
Liver cancer	Females	Cumulative Cigarettes (20 Years)	1	Positive
Liver cancer	Females	Hepatitis B Prevalence (proportion)	1	Positive
Liver cancer	Females	Hepatitis C Prevalence (proportion)	1	Positive
Liver cancer	Females	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Liver cancer	Females	Animal Fats (kcal per capita)	2	Positive
Liver cancer	Females	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Liver cancer	Females	Health System Access 2 (unitless)	2	Negative
Liver cancer	Females	Mean BMI	2	Positive
Liver cancer	Females	Red Meat (kcal per capita)	2	Positive
Liver cancer	Females	Education (years per capita)	3	Negative
Liver cancer	Females	LDI (I$ per capita)	3	Negative
Liver cancer	Males	Alcohol (liters per capita)	1	Positive
Liver cancer	Males	Cumulative Cigarettes (15 Years)	1	Positive
Liver cancer	Males	Cumulative Cigarettes (20 Years)	1	Positive
Liver cancer	Males	Hepatitis B Prevalence (proportion)	1	Positive
Liver cancer	Males	Hepatitis C Prevalence (proportion)	1	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Liver cancer	Males	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Liver cancer	Males	Animal Fats (kcal per capita)	2	Positive
Liver cancer	Males	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Liver cancer	Males	Health System Access 2 (unitless)	2	Negative
Liver cancer	Males	Mean BMI	2	Positive
Liver cancer	Males	Red Meat (kcal per capita)	2	Positive
Liver cancer	Males	Education (years per capita)	3	Negative
Liver cancer	Males	LDI (I$ per capita)	3	Negative
Larynx cancer	Females	Alcohol (liters per capita)	1	Positive
Larynx cancer	Females	Fruits (kcal per capita)	1	Negative
Larynx cancer	Females	Vegetables (kcal per capita)	1	Negative
Larynx cancer	Females	Cumulative Cigarettes (10 Years)	2	Positive
Larynx cancer	Females	Cumulative Cigarettes (15 Years)	2	Positive
Larynx cancer	Females	Cumulative Cigarettes (20 Years)	2	Positive
Larynx cancer	Females	Cumulative Cigarettes (5 Years)	2	Positive
Larynx cancer	Females	Indoor Air Pollution (All Cooking Fuels)	2	Positive
Larynx cancer	Females	Outdoor Air Pollution (PM2.5)	2	Positive
Larynx cancer	Females	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Larynx cancer	Females	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Larynx cancer	Females	Smoking Prevalence	2	Positive
Larynx cancer	Females	Tobacco (cigarettes per capita)	2	Positive
Larynx cancer	Females	Education (years per capita)	3	Negative
Larynx cancer	Females	LDI (I$ per capita)	3	Negative
Larynx cancer	Males	Alcohol (liters per capita)	1	Positive
Larynx cancer	Males	Fruits (kcal per capita)	1	Negative
Larynx cancer	Males	Vegetables (kcal per capita)	1	Negative
Larynx cancer	Males	Cumulative Cigarettes (10 Years)	2	Positive
Larynx cancer	Males	Cumulative Cigarettes (15 Years)	2	Positive
Larynx cancer	Males	Cumulative Cigarettes (20 Years)	2	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Larynx cancer	Males	Cumulative Cigarettes (5 Years)	2	Positive
Larynx cancer	Males	Indoor Air Pollution (All Cooking Fuels)	2	Positive
Larynx cancer	Males	Outdoor Air Pollution (PM2.5)	2	Positive
Larynx cancer	Males	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Larynx cancer	Males	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Larynx cancer	Males	Smoking Prevalence	2	Positive
Larynx cancer	Males	Tobacco (cigarettes per capita)	2	Positive
Larynx cancer	Males	Education (years per capita)	3	Negative
Larynx cancer	Males	LDI (I$ per capita)	3	Negative
Tracheal, bronchus and lung cancer	Females	Cumulative Cigarettes (10 Years)	1	Positive
Tracheal, bronchus and lung cancer	Females	Cumulative Cigarettes (15 Years)	1	Positive
Tracheal, bronchus and lung cancer	Females	Cumulative Cigarettes (20 Years)	1	Positive
Tracheal, bronchus and lung cancer	Females	Cumulative Cigarettes (5 Years)	1	Positive
Tracheal, bronchus and lung cancer	Females	Fruits (kcal per capita)	1	Negative
Tracheal, bronchus and lung cancer	Females	Indoor Air Pollution (All Cooking Fuels)	1	Positive
Tracheal, bronchus and lung cancer	Females	Outdoor Air Pollution (PM2.5)	1	Positive
Tracheal, bronchus and lung cancer	Females	Smoking Prevalence	1	Positive
Tracheal, bronchus and lung cancer	Females	Tobacco (cigarettes per capita)	1	Positive
Tracheal, bronchus and lung cancer	Females	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Tracheal, bronchus and lung cancer	Females	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Tracheal, bronchus and lung cancer	Females	Vegetables (kcal per capita)	2	Negative
Tracheal, bronchus and lung cancer	Females	Education (years per capita)	3	Negative
Tracheal, bronchus and lung cancer	Females	LDI (I$ per capita)	3	Negative
Tracheal, bronchus and lung cancer	Males	Cumulative Cigarettes (10 Years)	1	Positive
Tracheal, bronchus and lung cancer	Males	Cumulative Cigarettes (15 Years)	1	Positive
Tracheal, bronchus and lung cancer	Males	Cumulative Cigarettes (20 Years)	1	Positive
Tracheal, bronchus and lung cancer	Males	Cumulative Cigarettes (5 Years)	1	Positive
Tracheal, bronchus and lung cancer	Males	Fruits (kcal per capita)	1	Negative
Tracheal, bronchus and lung cancer	Males	Indoor Air Pollution (All Cooking Fuels)	1	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Tracheal, bronchus and lung cancer	Males	Outdoor Air Pollution (PM2.5)	1	Positive
Tracheal, bronchus and lung cancer	Males	Smoking Prevalence	1	Positive
Tracheal, bronchus and lung cancer	Males	Tobacco (cigarettes per capita)	1	Positive
Tracheal, bronchus and lung cancer	Males	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Tracheal, bronchus and lung cancer	Males	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Tracheal, bronchus and lung cancer	Males	Vegetables (kcal per capita)	2	Negative
Tracheal, bronchus and lung cancer	Males	Education (years per capita)	3	Negative
Tracheal, bronchus and lung cancer	Males	LDI (I$ per capita)	3	Negative
Breast cancer	Females	Alcohol (liters per capita)	1	Positive
Breast cancer	Females	Mean BMI	1	Positive
Breast cancer	Females	Animal Fats (kcal per capita)	2	Positive
Breast cancer	Females	Cumulative Cigarettes (10 Years)	2	Positive
Breast cancer	Females	Fertility (15-19 year olds)	2	Negative
Breast cancer	Females	Fruits (kcal per capita)	2	Negative
Breast cancer	Females	Health System Access 2 (unitless)	2	Negative
Breast cancer	Females	Latitude 15 to 30 (proportion)	2	None
Breast cancer	Females	Latitude 30 to 45 (proportion)	2	Negative
Breast cancer	Females	Latitude Over 45 (proportion)	2	Negative
Breast cancer	Females	Total Fertility Rate	2	Negative
Breast cancer	Females	Vegetables (kcal per capita)	2	Negative
Breast cancer	Females	Education (years per capita)	3	Negative
Breast cancer	Females	LDI (I$ per capita)	3	Negative
Breast cancer	Males	Alcohol (liters per capita)	1	Positive
Breast cancer	Males	Mean BMI	1	Positive
Breast cancer	Males	Animal Fats (kcal per capita)	2	Positive
Breast cancer	Males	Cumulative Cigarettes (10 Years)	2	Positive
Breast cancer	Males	Fertility (15-19 year olds)	2	Negative
Breast cancer	Males	Fruits (kcal per capita)	2	Negative
Breast cancer	Males	Health System Access 2 (unitless)	2	Negative

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Breast cancer	Males	Latitude 15 to 30 (proportion)	2	None
Breast cancer	Males	Latitude 30 to 45 (proportion)	2	Negative
Breast cancer	Males	Latitude Over 45 (proportion)	2	Negative
Breast cancer	Males	Total Fertility Rate	2	Negative
Breast cancer	Males	Vegetables (kcal per capita)	2	Negative
Breast cancer	Males	Education (years per capita)	3	Negative
Breast cancer	Males	LDI (I$ per capita)	3	Negative
Cervical cancer	Females	Abortion On-Demand Illegal (binary)	1	Positive
Cervical cancer	Females	Cumulative Cigarettes (10 Years)	1	Positive
Cervical cancer	Females	Cumulative Cigarettes (15 Years)	1	Positive
Cervical cancer	Females	Cumulative Cigarettes (5 Years)	1	Positive
Cervical cancer	Females	HIV Prevalence, ARV-Adjusted (Custom Lag, %)	1	Positive
Cervical cancer	Females	Smoking Prevalence	1	Positive
Cervical cancer	Females	Fertility (15-19 year olds)	2	Positive
Cervical cancer	Females	Fruits (kcal per capita)	2	Negative
Cervical cancer	Females	Health System Access 2 (unitless)	2	Negative
Cervical cancer	Females	Total Fertility Rate	2	Positive
Cervical cancer	Females	Vegetables (kcal per capita)	2	Negative
Cervical cancer	Females	Education (years per capita)	3	Negative
Cervical cancer	Females	LDI (I$ per capita)	3	Negative
Uterine cancer	Females	Mean BMI	1	Positive
Uterine cancer	Females	Cumulative Cigarettes (10 Years)	2	Positive
Uterine cancer	Females	Cumulative Cigarettes (5 Years)	2	Positive
Uterine cancer	Females	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Uterine cancer	Females	Fruits (kcal per capita)	2	Negative
Uterine cancer	Females	Health System Access (unitless)	2	Negative
Uterine cancer	Females	Smoking Prevalence	2	Positive
Uterine cancer	Females	Tobacco (cigarettes per capita) [lagged 20 years]	2	Positive
Uterine cancer	Females	Total Fertility Rate	2	None

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Uterine cancer	Females	Vegetables (kcal per capita)	2	Negative
Uterine cancer	Females	Education (years per capita)	3	Negative
Uterine cancer	Females	LDI (I$ per capita)	3	Negative
Prostate cancer	Males	Health System Access 2 (unitless)	1	Negative
Prostate cancer	Males	Animal Fats (kcal per capita)	2	Positive
Prostate cancer	Males	Education (years per capita)	3	None
Prostate cancer	Males	LDI (I$ per capita)	3	None
Colon and rectum cancer	Females	Alcohol (liters per capita)	1	Positive
Colon and rectum cancer	Females	Fruits (kcal per capita)	1	Negative
Colon and rectum cancer	Females	Mean BMI	1	Positive
Colon and rectum cancer	Females	Smoking Prevalence	1	Positive
Colon and rectum cancer	Females	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Colon and rectum cancer	Females	Vegetables (kcal per capita)	1	Negative
Colon and rectum cancer	Females	Whole Grains (kcal per capita)	1	Negative
Colon and rectum cancer	Females	ln-Milk (kcal per capita)	1	Negative
Colon and rectum cancer	Females	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Colon and rectum cancer	Females	Health System Access 2 (unitless)	2	Negative
Colon and rectum cancer	Females	Nuts & Seeds (kcal per capita)	2	Negative
Colon and rectum cancer	Females	PUFA Omega 3 - Seafood (kcal per capita)	2	Negative
Colon and rectum cancer	Females	Red Meat (kcal per capita)	2	Positive
Colon and rectum cancer	Females	Education (years per capita)	3	Negative
Colon and rectum cancer	Females	LDI (I$ per capita)	3	Negative
Colon and rectum cancer	Males	Alcohol (liters per capita)	1	Positive
Colon and rectum cancer	Males	Fruits (kcal per capita)	1	Negative
Colon and rectum cancer	Males	Mean BMI	1	Positive
Colon and rectum cancer	Males	Smoking Prevalence	1	Positive
Colon and rectum cancer	Males	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Colon and rectum cancer	Males	Vegetables (kcal per capita)	1	Negative
Colon and rectum cancer	Males	Whole Grains (kcal per capita)	1	Negative

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Colon and rectum cancer	Males	ln-Milk (kcal per capita)	1	Negative
Colon and rectum cancer	Males	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Colon and rectum cancer	Males	Health System Access 2 (unitless)	2	Negative
Colon and rectum cancer	Males	Nuts & Seeds (kcal per capita)	2	Negative
Colon and rectum cancer	Males	PUFA Omega 3 - Seafood (kcal per capita)	2	Negative
Colon and rectum cancer	Males	Red Meat (kcal per capita)	2	Positive
Colon and rectum cancer	Males	Education (years per capita)	3	Negative
Colon and rectum cancer	Males	LDI (I$ per capita)	3	Negative
Lip and oral cavity cancer	Females	Alcohol (liters per capita)	1	Positive
Lip and oral cavity cancer	Females	Cumulative Cigarettes (10 Years)	1	Positive
Lip and oral cavity cancer	Females	Cumulative Cigarettes (20 Years)	1	Positive
Lip and oral cavity cancer	Females	Cumulative Cigarettes (5 Years)	1	Positive
Lip and oral cavity cancer	Females	Fruits (kcal per capita)	1	Negative
Lip and oral cavity cancer	Females	Smoking Prevalence [lagged 10 years]	1	Positive
Lip and oral cavity cancer	Females	Vegetables (kcal per capita)	1	Negative
Lip and oral cavity cancer	Females	Health System Access 2 (unitless)	2	Negative
Lip and oral cavity cancer	Females	Red Meat (kcal per capita)	2	Positive
Lip and oral cavity cancer	Females	Education (years per capita)	3	Negative
Lip and oral cavity cancer	Females	LDI (I$ per capita)	3	Negative
Lip and oral cavity cancer	Males	Alcohol (liters per capita)	1	Positive
Lip and oral cavity cancer	Males	Cumulative Cigarettes (10 Years)	1	Positive
Lip and oral cavity cancer	Males	Cumulative Cigarettes (20 Years)	1	Positive
Lip and oral cavity cancer	Males	Cumulative Cigarettes (5 Years)	1	Positive
Lip and oral cavity cancer	Males	Fruits (kcal per capita)	1	Negative
Lip and oral cavity cancer	Males	Smoking Prevalence [lagged 10 years]	1	Positive
Lip and oral cavity cancer	Males	Vegetables (kcal per capita)	1	Negative
Lip and oral cavity cancer	Males	Health System Access 2 (unitless)	2	Negative
Lip and oral cavity cancer	Males	Red Meat (kcal per capita)	2	Positive
Lip and oral cavity cancer	Males	Education (years per capita)	3	Negative

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Lip and oral cavity cancer	Males	LDI (I$ per capita)	3	Negative
Nasopharynx cancer	Females	Alcohol (liters per capita)	1	Positive
Nasopharynx cancer	Females	Vegetables (kcal per capita)	1	Negative
Nasopharynx cancer	Females	Fruits (kcal per capita)	2	Negative
Nasopharynx cancer	Females	Health System Access 2 (unitless)	2	Negative
Nasopharynx cancer	Females	Malnutrition (proportion <2SD weight for age)	2	Positive
Nasopharynx cancer	Females	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Nasopharynx cancer	Females	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Nasopharynx cancer	Females	Whole Grains (kcal per capita)	2	Negative
Nasopharynx cancer	Females	Education (years per capita)	3	Negative
Nasopharynx cancer	Females	LDI (I$ per capita)	3	Negative
Nasopharynx cancer	Males	Alcohol (liters per capita)	1	Positive
Nasopharynx cancer	Males	Vegetables (kcal per capita)	1	Negative
Nasopharynx cancer	Males	Fruits (kcal per capita)	2	Negative
Nasopharynx cancer	Males	Health System Access 2 (unitless)	2	Negative
Nasopharynx cancer	Males	Malnutrition (proportion <2SD weight for age)	2	Positive
Nasopharynx cancer	Males	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Nasopharynx cancer	Males	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Nasopharynx cancer	Males	Whole Grains (kcal per capita)	2	Negative
Nasopharynx cancer	Males	Education (years per capita)	3	Negative
Nasopharynx cancer	Males	LDI (I$ per capita)	3	Negative
Other pharynx cancer	Females	Alcohol (liters per capita)	1	Positive
Other pharynx cancer	Females	Fruits (kcal per capita)	1	Negative
Other pharynx cancer	Females	Smoking Prevalence	1	Positive
Other pharynx cancer	Females	Vegetables (kcal per capita)	1	Negative
Other pharynx cancer	Females	Cumulative Cigarettes (5 Years)	2	Positive
Other pharynx cancer	Females	Health System Access (capped)	2	Negative
Other pharynx cancer	Females	Malnutrition (proportion <2SD weight for age)	2	Positive
Other pharynx cancer	Females	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Other pharynx cancer	Females	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Other pharynx cancer	Females	Whole Grains (kcal per capita)	2	Negative
Other pharynx cancer	Females	Education (years per capita)	3	Negative
Other pharynx cancer	Females	LDI (I$ per capita)	3	Negative
Other pharynx cancer	Males	Alcohol (liters per capita)	1	Positive
Other pharynx cancer	Males	Fruits (kcal per capita)	1	Negative
Other pharynx cancer	Males	Smoking Prevalence	1	Positive
Other pharynx cancer	Males	Vegetables (kcal per capita)	1	Negative
Other pharynx cancer	Males	Cumulative Cigarettes (5 Years)	2	Positive
Other pharynx cancer	Males	Health System Access (capped)	2	Negative
Other pharynx cancer	Males	Malnutrition (proportion <2SD weight for age)	2	Positive
Other pharynx cancer	Males	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Other pharynx cancer	Males	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Other pharynx cancer	Males	Whole Grains (kcal per capita)	2	Negative
Other pharynx cancer	Males	Education (years per capita)	3	Negative
Other pharynx cancer	Males	LDI (I$ per capita)	3	Negative
Gallbladder and biliary tract cancer	Females	Mean BMI	1	Positive
Gallbladder and biliary tract cancer	Females	Total Calories (kcal per capita)	1	Positive
Gallbladder and biliary tract cancer	Females	Alcohol (liters per capita)	2	Positive
Gallbladder and biliary tract cancer	Females	Cumulative Cigarettes (10 Years)	2	Positive
Gallbladder and biliary tract cancer	Females	Cumulative Cigarettes (5 Years)	2	Positive
Gallbladder and biliary tract cancer	Females	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Gallbladder and biliary tract cancer	Females	Fruits (kcal per capita)	2	Negative
Gallbladder and biliary tract cancer	Females	Health System Access (capped)	2	Negative
Gallbladder and biliary tract cancer	Females	Smoking Prevalence [lagged 20 years]	2	Positive
Gallbladder and biliary tract cancer	Females	Tobacco (cigarettes per capita)	2	Positive
Gallbladder and biliary tract cancer	Females	Vegetables (kcal per capita)	2	Negative
Gallbladder and biliary tract cancer	Females	Education (years per capita)	3	Negative
Gallbladder and biliary tract cancer	Females	LDI (I$ per capita)	3	Negative

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Gallbladder and biliary tract cancer	Males	Mean BMI	1	Positive
Gallbladder and biliary tract cancer	Males	Total Calories (kcal per capita)	1	Positive
Gallbladder and biliary tract cancer	Males	Alcohol (liters per capita)	2	Positive
Gallbladder and biliary tract cancer	Males	Cumulative Cigarettes (10 Years)	2	Positive
Gallbladder and biliary tract cancer	Males	Cumulative Cigarettes (5 Years)	2	Positive
Gallbladder and biliary tract cancer	Males	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Gallbladder and biliary tract cancer	Males	Fruits (kcal per capita)	2	Negative
Gallbladder and biliary tract cancer	Males	Health System Access (capped)	2	Negative
Gallbladder and biliary tract cancer	Males	Smoking Prevalence [lagged 20 years]	2	Positive
Gallbladder and biliary tract cancer	Males	Tobacco (cigarettes per capita)	2	Positive
Gallbladder and biliary tract cancer	Males	Vegetables (kcal per capita)	2	Negative
Gallbladder and biliary tract cancer	Males	Education (years per capita)	3	Negative
Gallbladder and biliary tract cancer	Males	LDI (I$ per capita)	3	Negative
Pancreatic cancer	Females	Cumulative Cigarettes (10 Years)	1	Positive
Pancreatic cancer	Females	Cumulative Cigarettes (20 Years)	1	Positive
Pancreatic cancer	Females	Cumulative Cigarettes (5 Years)	1	Positive
Pancreatic cancer	Females	Mean BMI	1	Positive
Pancreatic cancer	Females	Smoking Prevalence	1	Positive
Pancreatic cancer	Females	Tobacco (cigarettes per capita)	1	Positive
Pancreatic cancer	Females	Total Calories (kcal per capita)	1	Positive
Pancreatic cancer	Females	Alcohol (liters per capita)	2	Positive
Pancreatic cancer	Females	Animal Fats (kcal per capita)	2	Positive
Pancreatic cancer	Females	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Pancreatic cancer	Females	Fruits (kcal per capita)	2	Negative
Pancreatic cancer	Females	Red Meat (kcal per capita)	2	Positive
Pancreatic cancer	Females	Vegetables (kcal per capita)	2	Negative
Pancreatic cancer	Females	Education (years per capita)	3	Negative
Pancreatic cancer	Females	Health System Access (unitless)	3	Negative
Pancreatic cancer	Females	LDI (I$ per capita)	3	Negative

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Pancreatic cancer	Males	Cumulative Cigarettes (10 Years)	1	Positive
Pancreatic cancer	Males	Cumulative Cigarettes (20 Years)	1	Positive
Pancreatic cancer	Males	Cumulative Cigarettes (5 Years)	1	Positive
Pancreatic cancer	Males	Mean BMI	1	Positive
Pancreatic cancer	Males	Smoking Prevalence	1	Positive
Pancreatic cancer	Males	Tobacco (cigarettes per capita)	1	Positive
Pancreatic cancer	Males	Total Calories (kcal per capita)	1	Positive
Pancreatic cancer	Males	Alcohol (liters per capita)	2	Positive
Pancreatic cancer	Males	Animal Fats (kcal per capita)	2	Positive
Pancreatic cancer	Males	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Pancreatic cancer	Males	Fruits (kcal per capita)	2	Negative
Pancreatic cancer	Males	Red Meat (kcal per capita)	2	Positive
Pancreatic cancer	Males	Vegetables (kcal per capita)	2	Negative
Pancreatic cancer	Males	Education (years per capita)	3	Negative
Pancreatic cancer	Males	Health System Access (unitless)	3	Negative
Pancreatic cancer	Males	LDI (I$ per capita)	3	Negative
Malignant skin melanoma	Females	Alcohol (liters per capita)	1	Positive
Malignant skin melanoma	Females	Cumulative Cigarettes (20 Years)	1	Positive
Malignant skin melanoma	Females	Fruits (kcal per capita)	1	Negative
Malignant skin melanoma	Females	Smoking Prevalence [lagged 10 years]	1	Positive
Malignant skin melanoma	Females	Tobacco (cigarettes per capita)	1	Positive
Malignant skin melanoma	Females	Vegetables (kcal per capita)	1	Negative
Malignant skin melanoma	Females	Animal Fats (kcal per capita)	2	Positive
Malignant skin melanoma	Females	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Malignant skin melanoma	Females	Latitude 15 to 30 (proportion)	2	None
Malignant skin melanoma	Females	Latitude 30 to 45 (proportion)	2	Negative
Malignant skin melanoma	Females	Latitude Over 45 (proportion)	2	Negative
Malignant skin melanoma	Females	Mean BMI	2	Positive
Malignant skin melanoma	Females	Education (years per capita)	3	Negative

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Malignant skin melanoma	Females	LDI (I$ per capita)	3	Negative
Malignant skin melanoma	Males	Alcohol (liters per capita)	1	Positive
Malignant skin melanoma	Males	Cumulative Cigarettes (20 Years)	1	Positive
Malignant skin melanoma	Males	Fruits (kcal per capita)	1	Negative
Malignant skin melanoma	Males	Smoking Prevalence [lagged 10 years]	1	Positive
Malignant skin melanoma	Males	Tobacco (cigarettes per capita)	1	Positive
Malignant skin melanoma	Males	Vegetables (kcal per capita)	1	Negative
Malignant skin melanoma	Males	Animal Fats (kcal per capita)	2	Positive
Malignant skin melanoma	Males	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Malignant skin melanoma	Males	Latitude 15 to 30 (proportion)	2	None
Malignant skin melanoma	Males	Latitude 30 to 45 (proportion)	2	Negative
Malignant skin melanoma	Males	Latitude Over 45 (proportion)	2	Negative
Malignant skin melanoma	Males	Mean BMI	2	Positive
Malignant skin melanoma	Males	Education (years per capita)	3	Negative
Malignant skin melanoma	Males	LDI (I$ per capita)	3	Negative
Ovarian cancer	Females	Alcohol (liters per capita)	1	Positive
Ovarian cancer	Females	Contraception (Modern) Prevalence (proportion)	1	Negative
Ovarian cancer	Females	Cumulative Cigarettes (20 Years)	1	Positive
Ovarian cancer	Females	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Ovarian cancer	Females	Animal Fats (kcal per capita)	2	Positive
Ovarian cancer	Females	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Ovarian cancer	Females	Fruits (kcal per capita)	2	Negative
Ovarian cancer	Females	Latitude 15 to 30 (proportion)	2	None
Ovarian cancer	Females	Latitude 30 to 45 (proportion)	2	Negative
Ovarian cancer	Females	Latitude Over 45 (proportion)	2	Negative
Ovarian cancer	Females	Mean BMI	2	Positive
Ovarian cancer	Females	Smoking Prevalence [lagged 20 years]	2	Positive
Ovarian cancer	Females	Total Calories (kcal per capita)	2	Positive
Ovarian cancer	Females	Total Fertility Rate	2	None

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Ovarian cancer	Females	Vegetables (kcal per capita)	2	Negative
Ovarian cancer	Females	Education (years per capita)	3	Negative
Ovarian cancer	Females	LDI (I$ per capita)	3	Negative
Testicular cancer	Males	Cumulative Cigarettes (10 Years)	2	Positive
Testicular cancer	Males	Cumulative Cigarettes (15 Years)	2	Positive
Testicular cancer	Males	Cumulative Cigarettes (5 Years)	2	Positive
Testicular cancer	Males	Fruits (kcal per capita)	2	Negative
Testicular cancer	Males	Health System Access 2 (unitless)	2	Negative
Testicular cancer	Males	Vegetables (kcal per capita)	2	Negative
Testicular cancer	Males	Education (years per capita)	3	Negative
Testicular cancer	Males	LDI (I$ per capita)	3	Negative
Kidney cancer	Females	Cumulative Cigarettes (10 Years)	1	Positive
Kidney cancer	Females	Cumulative Cigarettes (15 Years)	1	Positive
Kidney cancer	Females	Cumulative Cigarettes (5 Years)	1	Positive
Kidney cancer	Females	Mean BMI	1	Positive
Kidney cancer	Females	Smoking Prevalence	1	Positive
Kidney cancer	Females	Total Calories (kcal per capita)	1	Positive
Kidney cancer	Females	Alcohol (liters per capita)	2	Positive
Kidney cancer	Females	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Kidney cancer	Females	Health System Access 2 (unitless)	2	Negative
Kidney cancer	Females	Systolic Blood Pressure (mmHg)	2	Positive
Kidney cancer	Females	Education (years per capita)	3	Negative
Kidney cancer	Females	LDI (I$ per capita)	3	Negative
Kidney cancer	Females	Total Fertility Rate	3	None
Kidney cancer	Males	Cumulative Cigarettes (10 Years)	1	Positive
Kidney cancer	Males	Cumulative Cigarettes (15 Years)	1	Positive
Kidney cancer	Males	Cumulative Cigarettes (5 Years)	1	Positive
Kidney cancer	Males	Mean BMI	1	Positive
Kidney cancer	Males	Smoking Prevalence	1	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Kidney cancer	Males	Total Calories (kcal per capita)	1	Positive
Kidney cancer	Males	Alcohol (liters per capita)	2	Positive
Kidney cancer	Males	Diabetes Age-Standardized Prevalence (proportion)	2	Positive
Kidney cancer	Males	Health System Access 2 (unitless)	2	Negative
Kidney cancer	Males	Systolic Blood Pressure (mmHg)	2	Positive
Kidney cancer	Males	Education (years per capita)	3	Negative
Kidney cancer	Males	LDI (I$ per capita)	3	Negative
Kidney cancer	Males	Total Fertility Rate	3	None
Bladder cancer	Females	Cumulative Cigarettes (10 Years)	1	Positive
Bladder cancer	Females	Cumulative Cigarettes (15 Years)	1	Positive
Bladder cancer	Females	Fruits (kcal per capita)	1	Negative
Bladder cancer	Females	Health System Access 2 (unitless)	1	Negative
Bladder cancer	Females	Smoking Prevalence [lagged 10 years]	1	Positive
Bladder cancer	Females	Vegetables (kcal per capita)	1	Negative
Bladder cancer	Females	Alcohol (liters per capita)	2	Positive
Bladder cancer	Females	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Bladder cancer	Females	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Bladder cancer	Females	Education (years per capita)	3	Negative
Bladder cancer	Females	LDI (I$ per capita)	3	Negative
Bladder cancer	Males	Cumulative Cigarettes (10 Years)	1	Positive
Bladder cancer	Males	Cumulative Cigarettes (15 Years)	1	Positive
Bladder cancer	Males	Cumulative Cigarettes (5 Years)	1	Positive
Bladder cancer	Males	Smoking Prevalence [lagged 10 years]	1	Positive
Bladder cancer	Males	Alcohol (liters per capita)	2	Positive
Bladder cancer	Males	Fruits (kcal per capita)	2	Negative
Bladder cancer	Males	Health System Access 2 (unitless)	2	Negative
Bladder cancer	Males	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Bladder cancer	Males	Population Density (under 150 ppl/sqkm, proportion)	2	Positive
Bladder cancer	Males	Vegetables (kcal per capita)	2	Negative

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Bladder cancer	Males	Education (years per capita)	3	Negative
Bladder cancer	Males	LDI (I$ per capita)	3	Negative
Brain and nervous system cancer	Females	Alcohol (liters per capita)	1	Positive
Brain and nervous system cancer	Females	Cumulative Cigarettes (10 Years)	1	Positive
Brain and nervous system cancer	Females	Cumulative Cigarettes (15 Years)	1	Positive
Brain and nervous system cancer	Females	Smoking Prevalence [lagged 20 years]	1	Positive
Brain and nervous system cancer	Females	Animal Fats (kcal per capita)	2	Positive
Brain and nervous system cancer	Females	Cholesterol (total, mean per capita)	2	Positive
Brain and nervous system cancer	Females	Fruits (kcal per capita)	2	Negative
Brain and nervous system cancer	Females	Health System Access 2 (unitless)	2	Negative
Brain and nervous system cancer	Females	Red Meat (kcal per capita)	2	Positive
Brain and nervous system cancer	Females	Systolic Blood Pressure (mmHg)	2	Positive
Brain and nervous system cancer	Females	Vegetables (kcal per capita)	2	Negative
Brain and nervous system cancer	Females	Education (years per capita)	3	Negative
Brain and nervous system cancer	Females	LDI (I$ per capita)	3	Negative
Brain and nervous system cancer	Males	Alcohol (liters per capita)	1	Positive
Brain and nervous system cancer	Males	Cumulative Cigarettes (10 Years)	1	Positive
Brain and nervous system cancer	Males	Cumulative Cigarettes (15 Years)	1	Positive
Brain and nervous system cancer	Males	Smoking Prevalence [lagged 20 years]	1	Positive
Brain and nervous system cancer	Males	Animal Fats (kcal per capita)	2	Positive
Brain and nervous system cancer	Males	Cholesterol (total, mean per capita)	2	Positive
Brain and nervous system cancer	Males	Fruits (kcal per capita)	2	Negative
Brain and nervous system cancer	Males	Health System Access 2 (unitless)	2	Negative
Brain and nervous system cancer	Males	Red Meat (kcal per capita)	2	Positive
Brain and nervous system cancer	Males	Systolic Blood Pressure (mmHg)	2	Positive
Brain and nervous system cancer	Males	Vegetables (kcal per capita)	2	Negative
Brain and nervous system cancer	Males	Education (years per capita)	3	Negative
Brain and nervous system cancer	Males	LDI (I$ per capita)	3	Negative
Thyroid cancer	Females	Alcohol (liters per capita)	1	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Thyroid cancer	Females	Smoking Prevalence [lagged 10 years]	1	Positive
Thyroid cancer	Females	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Thyroid cancer	Females	Fruits (kcal per capita)	2	Negative
Thyroid cancer	Females	Improved Water Source (proportion with access)	2	Negative
Thyroid cancer	Females	Mean BMI	2	Positive
Thyroid cancer	Females	Red Meat (kcal per capita)	2	Positive
Thyroid cancer	Females	Sanitation (proportion with access)	2	Negative
Thyroid cancer	Females	Vegetables (kcal per capita)	2	Negative
Thyroid cancer	Females	Education (years per capita)	3	Negative
Thyroid cancer	Females	LDI (I$ per capita)	3	Negative
Thyroid cancer	Males	Alcohol (liters per capita)	1	Positive
Thyroid cancer	Males	Smoking Prevalence [lagged 10 years]	1	Positive
Thyroid cancer	Males	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Thyroid cancer	Males	Fruits (kcal per capita)	2	Negative
Thyroid cancer	Males	Improved Water Source (proportion with access)	2	Negative
Thyroid cancer	Males	Mean BMI	2	Positive
Thyroid cancer	Males	Red Meat (kcal per capita)	2	Positive
Thyroid cancer	Males	Sanitation (proportion with access)	2	Negative
Thyroid cancer	Males	Vegetables (kcal per capita)	2	Negative
Thyroid cancer	Males	Education (years per capita)	3	Negative
Thyroid cancer	Males	LDI (I$ per capita)	3	Negative
Mesothelioma	Females	Asbestos production (binary)	1	Positive
Mesothelioma	Females	Cumulative Cigarettes (5 Years)	1	Positive
Mesothelioma	Females	Health System Access 2 (unitless)	1	Negative
Mesothelioma	Females	Indoor Air Pollution (Coal Cooking)	1	Positive
Mesothelioma	Females	Smoking Prevalence	1	Positive
Mesothelioma	Females	Asbestos production (kg) per capita	2	Positive
Mesothelioma	Females	Elevation 500 to 1500m (proportion)	2	Positive
Mesothelioma	Females	Elevation Over 1500m (proportion)	2	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Mesothelioma	Females	Gold production (binary)	2	Positive
Mesothelioma	Females	Gold production (kg) per capita	2	Positive
Mesothelioma	Females	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Mesothelioma	Females	Population Over 65 (proportion)	2	Positive
Mesothelioma	Females	Education (years per capita)	3	Negative
Mesothelioma	Females	LDI (I$ per capita)	3	Negative
Mesothelioma	Males	Asbestos production (binary)	1	Positive
Mesothelioma	Males	Cumulative Cigarettes (5 Years)	1	Positive
Mesothelioma	Males	Health System Access 2 (unitless)	1	Negative
Mesothelioma	Males	Indoor Air Pollution (Coal Cooking)	1	Positive
Mesothelioma	Males	Smoking Prevalence	1	Positive
Mesothelioma	Males	Asbestos production (kg) per capita	2	Positive
Mesothelioma	Males	Elevation 500 to 1500m (proportion)	2	Positive
Mesothelioma	Males	Elevation Over 1500m (proportion)	2	Positive
Mesothelioma	Males	Gold production (binary)	2	Positive
Mesothelioma	Males	Gold production (kg) per capita	2	Positive
Mesothelioma	Males	Population Density (over 1000 ppl/sqkm, proportion)	2	Positive
Mesothelioma	Males	Population Over 65 (proportion)	2	Positive
Mesothelioma	Males	Education (years per capita)	3	Negative
Mesothelioma	Males	LDI (I$ per capita)	3	Negative
Hodgkin lymphoma	Females	Health System Access 2 (unitless)	1	Negative
Hodgkin lymphoma	Females	Education (years per capita)	2	None
Hodgkin lymphoma	Females	LDI (I$ per capita)	2	None
Hodgkin lymphoma	Females	Latitude 15 to 30 (proportion)	3	None
Hodgkin lymphoma	Females	Latitude 30 to 45 (proportion)	3	None
Hodgkin lymphoma	Females	Latitude Over 45 (proportion)	3	Positive
Hodgkin lymphoma	Females	Latitude Under 15 (proportion)	3	Negative
Hodgkin lymphoma	Males	Health System Access 2 (unitless)	1	Negative
Hodgkin lymphoma	Males	Education (years per capita)	2	None

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Hodgkin lymphoma	Males	LDI (I$ per capita)	2	None
Hodgkin lymphoma	Males	Latitude 15 to 30 (proportion)	3	None
Hodgkin lymphoma	Males	Latitude 30 to 45 (proportion)	3	None
Hodgkin lymphoma	Males	Latitude Over 45 (proportion)	3	Positive
Hodgkin lymphoma	Males	Latitude Under 15 (proportion)	3	Negative
Non-Hodgkin lymphoma	Females	Health System Access 2 (unitless)	1	Negative
Non-Hodgkin lymphoma	Females	Alcohol (liters per capita)	2	Positive
Non-Hodgkin lymphoma	Females	Cumulative Cigarettes (10 Years)	2	Positive
Non-Hodgkin lymphoma	Females	Smoking Prevalence	2	Positive
Non-Hodgkin lymphoma	Females	LDI (I$ per capita)	3	Negative
Non-Hodgkin lymphoma	Females	Total Fertility Rate	3	None
Non-Hodgkin lymphoma	Males	Health System Access 2 (unitless)	1	Negative
Non-Hodgkin lymphoma	Males	Alcohol (liters per capita)	2	Positive
Non-Hodgkin lymphoma	Males	Cumulative Cigarettes (10 Years)	2	Positive
Non-Hodgkin lymphoma	Males	Smoking Prevalence	2	Positive
Non-Hodgkin lymphoma	Males	LDI (I$ per capita)	3	Negative
Non-Hodgkin lymphoma	Males	Total Fertility Rate	3	None
Multiple myeloma	Females	Alcohol (liters per capita)	1	Positive
Multiple myeloma	Females	Red Meat (kcal per capita)	1	Positive
Multiple myeloma	Females	Smoking Prevalence	1	Positive
Multiple myeloma	Females	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Multiple myeloma	Females	Fruits (kcal per capita)	2	Negative
Multiple myeloma	Females	Improved Water Source (proportion with access)	2	Negative
Multiple myeloma	Females	Mean BMI	2	Positive
Multiple myeloma	Females	Sanitation (proportion with access)	2	Negative
Multiple myeloma	Females	Vegetables (kcal per capita)	2	Negative
Multiple myeloma	Females	Education (years per capita)	3	Negative
Multiple myeloma	Females	LDI (I$ per capita)	3	Negative
Multiple myeloma	Males	Alcohol (liters per capita)	1	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Multiple myeloma	Males	Red Meat (kcal per capita)	1	Positive
Multiple myeloma	Males	Smoking Prevalence	1	Positive
Multiple myeloma	Males	Tobacco (cigarettes per capita) [lagged 10 years]	1	Positive
Multiple myeloma	Males	Fruits (kcal per capita)	2	Negative
Multiple myeloma	Males	Improved Water Source (proportion with access)	2	Negative
Multiple myeloma	Males	Mean BMI	2	Positive
Multiple myeloma	Males	Sanitation (proportion with access)	2	Negative
Multiple myeloma	Males	Vegetables (kcal per capita)	2	Negative
Multiple myeloma	Males	Education (years per capita)	3	Negative
Multiple myeloma	Males	LDI (I$ per capita)	3	Negative
Leukemia	Females	Cumulative Cigarettes (10 Years)	1	Positive
Leukemia	Females	Cumulative Cigarettes (15 Years)	1	Positive
Leukemia	Females	Cumulative Cigarettes (5 Years)	1	Positive
Leukemia	Females	Health System Access 2 (unitless)	1	Negative
Leukemia	Females	Smoking Prevalence	1	Positive
Leukemia	Females	Alcohol (liters per capita)	2	Positive
Leukemia	Females	Total Fertility Rate	2	None
Leukemia	Females	Education (years per capita)	3	Negative
Leukemia	Females	LDI (I$ per capita)	3	Negative
Leukemia	Males	Cumulative Cigarettes (10 Years)	1	Positive
Leukemia	Males	Cumulative Cigarettes (15 Years)	1	Positive
Leukemia	Males	Cumulative Cigarettes (5 Years)	1	Positive
Leukemia	Males	Health System Access 2 (unitless)	1	Negative
Leukemia	Males	Smoking Prevalence	1	Positive
Leukemia	Males	Alcohol (liters per capita)	2	Positive
Leukemia	Males	Total Fertility Rate	2	None
Leukemia	Males	Education (years per capita)	3	Negative
Leukemia	Males	LDI (I$ per capita)	3	Negative
Other neoplasms	Females	Smoking Prevalence [lagged 20 years]	1	Positive

eTable 11: Covariates selected for CODEm for each GBD cancer group

Cause	Sex	Covariate	Level	Direction
Other neoplasms	Females	Tobacco (cigarettes per capita) [lagged 20 years]	1	Positive
Other neoplasms	Females	Fruits (kcal per capita)	2	Negative
Other neoplasms	Females	Health System Access 2 (unitless)	2	Negative
Other neoplasms	Females	Nuts & Seeds (kcal per capita)	2	Negative
Other neoplasms	Females	PUFA Omega 3 - Seafood (kcal per capita)	2	Negative
Other neoplasms	Females	Vegetables (kcal per capita)	2	Negative
Other neoplasms	Females	Education (years per capita)	3	Negative
Other neoplasms	Females	LDI (I$ per capita)	3	Negative
Other neoplasms	Males	Smoking Prevalence [lagged 20 years]	1	Positive
Other neoplasms	Males	Tobacco (cigarettes per capita) [lagged 20 years]	1	Positive
Other neoplasms	Males	Fruits (kcal per capita)	2	Negative
Other neoplasms	Males	Health System Access 2 (unitless)	2	Negative
Other neoplasms	Males	Nuts & Seeds (kcal per capita)	2	Negative
Other neoplasms	Males	PUFA Omega 3 - Seafood (kcal per capita)	2	Negative
Other neoplasms	Males	Vegetables (kcal per capita)	2	Negative
Other neoplasms	Males	Education (years per capita)	3	Negative
Other neoplasms	Males	LDI (I$ per capita)	3	Negative

eTable 12: Results for CODEm model testing

Cause	Sex	Predictive Validity					
		RMSE In	RMSE Out	Trend In	Trend Out	Coverage In	Coverage Out
Esophageal cancer [Developed]	Females	0·328	0·505	0·140	0·204	0·996	0·971
Esophageal cancer [Developed]	Males	0·292	0·448	0·076	0·102	0·995	0·975
Esophageal cancer [Developing]	Females	0·362	0·672	0·152	0·196	0·994	0·951
Esophageal cancer [Developing]	Males	0.314	0.540	0.092	0.107	0.993	0.951
Stomach cancer [Developed]	Females	0·275	0·364	0·059	0·062	0·993	0·968
Stomach cancer [Developed]	Males	0·243	0·319	0·045	0·054	0·991	0·977
Stomach cancer [Developing]	Females	0·289	0·441	0·075	0·090	0·994	0·967
Stomach cancer [Developing]	Males	0·287	0·445	0·085	0·118	0·990	0·956
Liver cancer [Developed]	Females	0·421	0·706	0·227	0·283	0·994	0·963
Liver cancer [Developed]	Males	0·424	0·695	0·234	0·263	0·994	0·956
Liver cancer [Developing]	Females	0·510	0·923	0·293	0·464	0·987	0·945
Liver cancer [Developing]	Males	0·505	0·811	0·322	0·363	0·985	0·940
Larynx cancer [Developed]	Females	0·536	0·597	0·429	0·410	0·985	0·980
Larynx cancer [Developed]	Males	0·334	0·400	0·087	0·081	0·997	0·986
Larynx cancer [Developing]	Females	0·534	0·753	0·408	0·403	0·989	0·973
Larynx cancer [Developing]	Males	0·354	0·538	0·116	0·126	0·996	0·975
Tracheal, bronchus, and lung cancers [Developed]	Females	0·271	0·403	0·062	0·070	0·992	0·952
Tracheal, bronchus, and lung cancers [Developed]	Males	0·251	0·340	0·047	0·060	0·988	0·954
Tracheal, bronchus, and lung cancers [Developing]	Females	0·298	0·466	0·076	0·084	0·990	0·948
Tracheal, bronchus, and lung cancers [Developing]	Males	0·276	0·457	0·068	0·084	0·987	0·941
Breast cancer [Developed]	Females	0·258	0·320	0·045	0·057	0·988	0·975
Breast cancer [Developed]	Males	0·678	0·952	0·749	0·857	0·985	0·954
Breast cancer [Developing]	Females	0·291	0·402	0·067	0·075	0·992	0·964
Breast cancer [Developing]	Males	0·647	1·016	0·624	0·821	0·985	0·945
Cervical cancer [Developed]	Females	0·297	0·378	0·070	0·076	0·994	0·983
Cervical cancer [Developing]	Females	0.319	0.474	0.089	0.098	0.995	0.975
Uterine cancer [Developed]	Females	0·523	0·721	0·156	0·231	0·987	0·972
Uterine cancer [Developing]	Females	0·468	0·641	0·148	0·179	0·993	0·977
Prostate cancer [Developed]	Males	0·297	0·401	0·058	0·068	0·994	0·984
Prostate cancer [Developing]	Males	0·339	0·510	0·094	0·110	0·995	0·981
Colon and rectum cancer [Developed]	Females	0·256	0·341	0·051	0·065	0·989	0·961
Colon and rectum cancer [Developed]	Males	0·225	0·297	0·050	0·058	0·989	0·967
Colon and rectum cancer [Developing]	Females	0·270	0·390	0·070	0·072	0·992	0·968
Colon and rectum cancer [Developing]	Males	0·246	0·369	0·061	0·070	0·992	0·969
Lip and oral cavity cancer [Developed]	Females	0·409	0·501	0·182	0·179	0·994	0·988
Lip and oral cavity cancer [Developed]	Males	0·301	0·431	0·073	0·091	0·995	0·984
Lip and oral cavity cancer [Developing]	Females	0·389	0·573	0·151	0·171	0·996	0·984

eTable 12: Results for CODEm model testing

Cause	Sex	Predictive Validity					
		RMSE In	RMSE Out	Trend In	Trend Out	Coverage In	Coverage Out
Lip and oral cavity cancer [Developing]	Males	0·295	0·471	0·076	0·087	0·997	0·979
Nasopharynx cancer [Developed]	Females	0·562	0·689	0·241	0·262	0·995	0·989
Nasopharynx cancer [Developed]	Males	0·472	0·604	0·121	0·141	0·997	0·989
Nasopharynx cancer [Developing]	Females	0·498	0·770	0·217	0·256	0·995	0·976
Nasopharynx cancer [Developing]	Males	0.425	0.683	0.109	0.141	0.996	0.974
Other pharynx cancer [Developed]	Females	0·484	0·572	0·212	0·173	0·992	0·986
Other pharynx cancer [Developed]	Males	0·330	0·496	0·083	0·105	0·999	0·982
Other pharynx cancer [Developing]	Females	0·454	0·677	0·174	0·216	0·994	0·979
Other pharynx cancer [Developing]	Males	0·345	0·587	0·088	0·104	0·996	0·968
Gallbladder and biliary tract cancer [Developed]	Females	0·327	0·494	0·062	0·080	0·997	0·977
Gallbladder and biliary tract cancer [Developed]	Males	0·315	0·469	0·099	0·097	0·998	0·978
Gallbladder and biliary tract cancer [Developing]	Females	0·403	0·635	0·110	0·132	0·992	0·965
Gallbladder and biliary tract cancer [Developing]	Males	0.374	0.609	0.130	0.172	0.995	0.966
Pancreatic cancer [Developed]	Females	0·264	0·400	0·071	0·102	0·988	0·971
Pancreatic cancer [Developed]	Males	0·277	0·392	0·068	0·089	0·988	0·974
Pancreatic cancer [Developing]	Females	0·316	0·535	0·095	0·132	0·993	0·973
Pancreatic cancer [Developing]	Males	0·313	0·525	0·089	0·115	0·994	0·977
Malignant skin melanoma [Developed]	Females	0·354	0·430	0·098	0·116	0·994	0·991
Malignant skin melanoma [Developed]	Males	0·327	0·439	0·116	0·125	0·998	0·993
Malignant skin melanoma [Developing]	Females	0·392	0·575	0·151	0·193	0·994	0·980
Malignant skin melanoma [Developing]	Males	0·372	0·530	0·155	0·161	0·997	0·986
Ovarian cancer [Developed]	Females	0·290	0·385	0·066	0·090	0·990	0·973
Ovarian cancer [Developing]	Females	0·314	0·484	0·092	0·120	0·993	0·978
Testicular cancer [Developed]	Males	0·606	0·737	0·440	0·483	0·981	0·964
Testicular cancer [Developing]	Males	0·575	0·829	0·346	0·420	0·990	0·964
Kidney cancer [Developed]	Females	0·448	0·576	0·126	0·146	0·997	0·990
Kidney cancer [Developed]	Males	0·368	0·515	0·079	0·092	0·995	0·988
Kidney cancer [Developing]	Females	0·406	0·627	0·107	0·146	0·996	0·984
Kidney cancer [Developing]	Males	0·362	0·550	0·085	0·108	0·995	0·983
Bladder cancer [Developed]	Females	0·341	0·468	0·091	0·100	0·996	0·988
Bladder cancer [Developed]	Males	0·307	0·406	0·058	0·069	0·993	0·985
Bladder cancer [Developing]	Females	0·407	0·621	0·149	0·179	0·995	0·979
Bladder cancer [Developing]	Males	0·341	0·550	0·084	0·107	0·993	0·970
Brain and nervous system cancer [Developed]	Females	0·301	0·458	0·120	0·159	0·996	0·978
Brain and nervous system cancer [Developed]	Males	0·291	0·372	0·105	0·116	0·997	0·987
Brain and nervous system cancer [Developing]	Females	0·366	0·600	0·145	0·195	0·996	0·973
Brain and nervous system cancer [Developing]	Males	0·356	0·558	0·130	0·144	0·997	0·980

eTable 12: Results for CODEm model testing

Cause	Sex	Predictive Validity					
		RMSE In	RMSE Out	Trend In	Trend Out	Coverage In	Coverage Out
Thyroid cancer [Developed]	Females	0·437	0·553	0·174	0·211	0·997	0·988
Thyroid cancer [Developed]	Males	0·463	0·572	0·247	0·330	0·993	0·986
Thyroid cancer [Developing]	Females	0·415	0·583	0·165	0·207	0·996	0·985
Thyroid cancer [Developing]	Males	0·435	0·629	0·204	0·287	0·995	0·983
Mesothelioma [Developed]	Females	0·521	0·815	0·336	0·464	0·994	0·966
Mesothelioma [Developed]	Males	0·548	0·809	0·300	0·358	0·992	0·973
Mesothelioma [Developing]	Females	0·470	0·777	0·261	0·317	0·995	0·971
Mesothelioma [Developing]	Males	0·465	0·803	0·219	0·303	0·995	0·963
Hodgkin lymphoma [Developed]	Females	0·520	0·731	0·339	0·432	0·992	0·976
Hodgkin lymphoma [Developed]	Males	0·564	0·751	0·375	0·458	0·988	0·975
Hodgkin lymphoma [Developing]	Females	0·564	0·903	0·369	0·463	0·992	0·962
Hodgkin lymphoma [Developing]	Males	0·604	0·950	0·380	0·438	0·989	0·953
Non-Hodgkin lymphoma [Developed]	Females	0·342	0·476	0·096	0·105	0·998	0·987
Non-Hodgkin lymphoma [Developed]	Males	0·292	0·415	0·080	0·092	0·998	0·989
Non-Hodgkin lymphoma [Developing]	Females	0·367	0·564	0·131	0·158	0·996	0·979
Non-Hodgkin lymphoma [Developing]	Males	0·330	0·505	0·110	0·130	0·996	0·978
Multiple myeloma [Developed]	Females	0·358	0·503	0·138	0·158	0·997	0·981
Multiple myeloma [Developed]	Males	0·333	0·452	0·113	0·121	0·998	0·990
Multiple myeloma [Developing]	Females	0·393	0·578	0·169	0·183	0·996	0·977
Multiple myeloma [Developing]	Males	0·370	0·548	0·149	0·148	0·997	0·983
Leukemia [Developed]	Females	0·279	0·355	0·098	0·113	0·995	0·989
Leukemia [Developed]	Males	0·273	0·344	0·093	0·114	0·995	0·988
Leukemia [Developing]	Females	0·379	0·543	0·203	0·297	0·992	0·977
Leukemia [Developing]	Males	0·369	0·518	0·189	0·266	0·992	0·979
Other neoplasms [Developed]	Females	0·235	0·398	0·091	0·101	0·998	0·973
Other neoplasms [Developed]	Males	0·240	0·413	0·096	0·099	0·999	0·979
Other neoplasms [Developing]	Females	0·267	0·476	0·105	0·124	0·997	0·977
Other neoplasms [Developing]	Males	0·262	0·469	0·107	0·138	0·998	0·974

eTable 13: Sources of procedure sequelae data

Sequela	Cancer	Sources	Procedure code (ICD-9-CM)
Mastectomy	Breast cancer	SEER (03-08)[207] Canada Hospital Data (94-09)[208] Mexico Hospital Data (01-09)[209] USA Hospital data[210]	854, 8541, 8542, 8543, 8544, 8545, 8546, 8547, 8548
Laryngectomy	Larynx cancer		301, 303, 304, 3029
Stoma	Colon and rectum cancer		461, 4610, 4611, 4613, , 4862
Incontinence	Bladder and prostate cancer		5771, 5779
Impotence	Prostate cancer		603, 604, 605, 606, 6062

eTable 14: Reference life expectancy[16]

Age	Reference life expectancy
0.00	86.59
1.00	85.77
5.00	81.81
10.00	76.83
15.00	71.86
20.00	66.91
25.00	61.97
30.00	57.02
35.00	52.10
40.00	47.20
45.00	42.35
50.00	37.58
55.00	32.89
60.00	28.29
65.00	23.79
70.00	19.41
75.00	15.26
80.00	11.45
85.00	8.15
90.00	5.53
95.00	3.71
100.00	2.50
105.00	1.62
110.00	1.37

eTable 15: ICD-10 codes for "other cancer" group*

ICD-10 code	Description
C17	Malignant neoplasm of small intestine
C30	Malignant neoplasm of nasal cavity and middle ear
C31	Malignant neoplasm of accessory sinuses
C37	Malignant neoplasm of thymus
C38	Malignant neoplasm of heart, mediastinum and pleura
C40	Malignant neoplasm of bone and articular cartilage of limbs
C41	Malignant neoplasm of bone and articular cartilage of other and unspecified sites
C47	Malignant neoplasm of peripheral nerves and autonomic nervous system
C48	Malignant neoplasm of retroperitoneum and peritoneum
C49	Malignant neoplasm of other connective and soft tissue
C4A	Merkel cell carcinoma
C51	Malignant neoplasm of vulva
C52	Malignant neoplasm of vagina
C58	Malignant neoplasm of placenta
C60	Malignant neoplasm of penis
C66	Malignant neoplasm of ureter
C69	Malignant neoplasm of eye and adnexa
C74	Malignant neoplasm of adrenal gland
C75	Malignant neoplasm of other endocrine glands and related structures

*For the four digit ICD-10 and ICD-9 codes, refer to eTable 3.

eTable 16a: Decomposition of trends in incidence, developed countries, both sexes, 1990 to 2013

Cause¤	Incident cases, 1990	Incident cases, 2013	Expected incident cases in 2013 given population growth alone	Expected incident cases in, 2013 given population growth and aging alone	Change in incident cases between 1990 and 2013 due to population growth*	Change in incident cases due to change in age structure₸	Change in incident cases due to change in incidence rates¥
All cancers, excl. NMSC, KS	4,283,225	6,602,086	4,726,817	6,125,924	10.4%	32.7%	11.1%
Esophageal cancer	61,163	80,581	67,497	89,254	10.4%	35.6%	-14.2%
Stomach cancer	330,457	306,940	364,680	486,104	10.4%	36.7%	-54.2%
Liver cancer	91,983	154,686	101,509	133,725	10.4%	35.0%	22.8%
Larynx cancer	63,823	57,884	70,432	89,642	10.4%	30.1%	-49.8%
Tracheal, bronchus and lung cancer	615,619	784,579	679,376	886,706	10.4%	33.7%	-16.6%
Breast cancer	534,011	787,965	589,315	747,158	10.4%	29.6%	7.6%
Cervical cancer	105,676	86,751	116,620	137,965	10.4%	20.2%	-48.5%
Uterine cancer	106,558	153,095	117,594	151,769	10.4%	32.1%	1.2%
Prostate cancer	339,273	912,184	374,410	508,197	10.4%	39.4%	119.1%
Colon and rectum cancer	569,959	899,877	628,987	847,893	10.4%	38.4%	9.1%
Lip and oral cavity cancer	89,940	118,488	99,254	128,050	10.4%	32.0%	-10.6%
Nasopharynx cancer	10,562	7,825	11,656	14,173	10.4%	23.8%	-60.1%
Other pharynx cancer	36,442	50,245	40,216	50,859	10.4%	29.2%	-1.7%
Gallbladder and biliary tract cancer	72,426	84,627	79,926	109,932	10.4%	41.4%	-34.9%
Pancreatic cancer	122,460	203,294	135,143	182,662	10.4%	38.8%	16.8%

eTable 16a: Decomposition of trends in incidence, developed countries, both sexes, 1990 to 2013

Cause[¤]	Incident cases, 1990	Incident cases, 2013	Expected incident cases in 2013 given population growth alone	Expected incident cases in, 2013 given population growth and aging alone	Change in incident cases between 1990 and 2013 due to population growth*	Change in incident cases due to change in age structure[₮]	Change in incident cases due to change in incidence rates[¥]
Malignant skin melanoma	105,151	199,111	116,041	140,687	10.4%	23.4%	55.6%
Ovarian cancer	86,940	108,898	95,944	120,828	10.4%	28.6%	-13.7%
Testicular cancer	23,083	24,068	25,474	24,552	10.4%	-4.0%	-2.1%
Kidney cancer	98,958	194,175	109,207	140,443	10.4%	31.6%	54.3%
Bladder cancer	197,736	275,578	218,215	294,202	10.4%	38.4%	-9.4%
Brain and nervous system cancer	69,706	99,270	76,926	88,520	10.4%	16.6%	15.4%
Thyroid cancer	55,097	84,894	60,803	70,719	10.4%	18.0%	25.7%
Mesothelioma	9,889	16,926	10,913	14,543	10.4%	36.7%	24.1%
Hodgkin lymphoma	29,148	27,178	32,167	33,085	10.4%	3.1%	-20.3%
Non-Hodgkin lymphoma	126,051	222,763	139,105	175,617	10.4%	29.0%	37.4%
Multiple myeloma	42,978	72,844	47,429	63,666	10.4%	37.8%	21.4%
Leukemia	115,233	154,138	127,167	155,991	10.4%	25.0%	-1.6%
Other neoplasms	172,903	433,222	190,810	238,984	10.4%	27.9%	112.3%

[¤]Cancers groups are defined based on the International Classification of Diseases (ICD) and include all ICD codes pertaining to neoplasms (ICD-9 140-239; ICD-10 C00-D49) excluding NMSC and KS. eTable 3 shows how the original ICD codes were mapped to the standardized GBD cause list.
* To estimate the effect of population growth we applied the population size of 2013 onto the rate, sex, and age structure of 1990. Since the global population grew by 35% between 1990 and 2013 and rates and age structure remained the same as in 1990, incidence due to all cancers increased by 35% in this counterfactual scenario.
[₮] To estimate the effect of aging on incident cases we applied the age structure of 2013 onto the rate, sex distribution, and population size of 1990. The change in incident cases reported in the table shows the proportion of the change in incidence cases between 1990 and 2013 that can be attributed to the changing age structure of the population.

eTable 16a: Decomposition of trends in incidence, developed countries, both sexes, 1990 to 2013

Cause¤	Incident cases, 1990	Incident cases, 2013	Expected incident cases in 2013 given population growth alone	Expected incident cases in, 2013 given population growth and aging alone	Change in incident cases between 1990 and 2013 due to population growth*	Change in incident cases due to change in age structure₸	Change in incident cases due to change in incidence rates¥
¥ To estimate the effect of changing incidence rates on the incident cases we applied the incidence rates for 1990 onto the population size and age structure of 2013. The change in incident cases reported in the table shows the proportion of the change in incidence cases between 1990 and 2013 that can be attributed to a change in incidence rates.							

eTable 16b: Decomposition of trends in incidence, developing countries, both sexes, 1990 to 2013

Cause¤	Incident cases, 1990	Incident cases, 2013	Expected incident cases in 2013 given population growth alone	Expected incident cases in, 2013 given population growth and aging alone	Change in incident cases between 1990 and 2013 due to population growth*	Change in incident cases due to change in age structure₮	Change in incident cases due to change in incidence rates¥
All cancers, excl. NMSC, KS	4,227,363	8,340,497	6,005,249	7,814,320	42.1%	42.8%	12.4%
Esophageal cancer	242,348	361,187	344,271	470,256	42.1%	52.0%	-45.0%
Stomach cancer	469,680	677,266	667,211	908,278	42.1%	51.3%	-49.2%
Liver cancer	373,031	637,517	529,915	710,704	42.1%	48.5%	-19.6%
Larynx cancer	73,962	118,803	105,068	141,834	42.1%	49.7%	-31.1%
Tracheal, bronchus and lung cancer	497,544	1,013,600	706,793	960,393	42.1%	51.0%	10.7%
Breast cancer	372,607	1,016,244	529,313	706,751	42.1%	47.6%	83.1%
Cervical cancer	341,668	398,546	485,362	634,244	42.1%	43.6%	-69.0%
Uterine cancer	110,234	200,022	156,595	211,211	42.1%	49.5%	-10.2%
Prostate cancer	115,140	530,276	163,563	225,621	42.1%	53.9%	264.6%
Colon and rectum cancer	248,480	672,713	352,983	477,991	42.1%	50.3%	78.4%
Lip and oral cavity cancer	148,850	290,871	211,451	284,268	42.1%	48.9%	4.4%
Nasopharynx cancer	57,096	75,877	81,109	104,240	42.1%	40.5%	-49.7%
Other pharynx cancer	44,250	89,322	62,860	85,631	42.1%	51.5%	8.3%
Gallbladder and biliary tract cancer	64,077	101,625	91,026	124,834	42.1%	52.8%	-36.2%
Pancreatic cancer	60,616	147,067	86,108	117,087	42.1%	51.1%	49.5%

eTable 16b: Decomposition of trends in incidence, developing countries, both sexes, 1990 to 2013

Cause[¤]	Incident cases, 1990	Incident cases, 2013	Expected incident cases in 2013 given population growth alone	Expected incident cases in, 2013 given population growth and aging alone	Change in incident cases between 1990 and 2013 due to population growth*	Change in incident cases due to change in age structure[Ŧ]	Change in incident cases due to change in incidence rates[¥]
Malignant skin melanoma	46,451	73,369	65,986	84,542	42.1%	39.9%	-24.1%
Ovarian cancer	50,476	117,305	71,705	93,242	42.1%	42.7%	47.7%
Testicular cancer	14,898	35,212	21,164	24,103	42.1%	19.7%	74.6%
Kidney cancer	43,505	100,326	61,802	77,110	42.1%	35.2%	53.4%
Bladder cancer	65,571	125,596	93,147	128,583	42.1%	54.0%	-4.6%
Brain and nervous system cancer	124,273	205,258	176,539	197,288	42.1%	16.7%	6.4%
Thyroid cancer	60,530	140,672	85,987	106,357	42.1%	33.7%	56.7%
Mesothelioma	7,083	16,818	10,061	13,464	42.1%	48.0%	47.3%
Hodgkin lymphoma	74,101	66,167	105,265	106,354	42.1%	1.5%	-54.2%
Non-Hodgkin lymphoma	100,610	242,724	142,923	173,140	42.1%	30.0%	69.2%
Multiple myeloma	19,760	44,103	28,070	37,713	42.1%	48.8%	32.3%
Leukemia	182,171	260,306	258,785	266,599	42.1%	4.3%	-3.5%
Other neoplasms	218,352	581,706	310,183	342,483	42.1%	14.8%	109.6%

[¤]Cancers groups are defined based on the International Classification of Diseases (ICD) and include all ICD codes pertaining to neoplasms (ICD-9 140-239; ICD-10 C00-D49) excluding NMSC, KS. eTable 3 shows how the original ICD codes were mapped to the standardized GBD cause list. We do not report results for non-melanoma skin cancer in this publication.

* To estimate the effect of population growth we applied the population size of 2013 onto the rate, sex, and age structure of 1990. Since the global population grew by 35% between 1990 and 2013 and rates and age structure remained the same as in 1990, incidence due to all cancers increased by 35% in this counterfactual scenario.

[Ŧ] To estimate the effect of aging on incident cases we applied the age structure of 2013 onto the rate, sex distribution, and population size of 1990. The change in incident cases reported in the table shows the proportion of the change in incidence cases between 1990 and 2013 that can be attributed to the changing age structure of the population.

eTable 16b: Decomposition of trends in incidence, developing countries, both sexes, 1990 to 2013

Cause¤	Incident cases, 1990	Incident cases, 2013	Expected incident cases in 2013 given population growth alone	Expected incident cases in, 2013 given population growth and aging alone	Change in incident cases between 1990 and 2013 due to population growth*	Change in incident cases due to change in age structure₮	Change in incident cases due to change in incidence rates¥
¥ To estimate the effect of changing incidence rates on the incident cases we applied the incidence rates for 1990 onto the population size and age structure of 2013. The change in incident cases reported in the table shows the proportion of the change in incidence cases between 1990 and 2013 that can be attributed to a change in incidence rates.							

eTable 17: Probability* of developing cancer within selected age intervals, global, by sex, 2010-2013

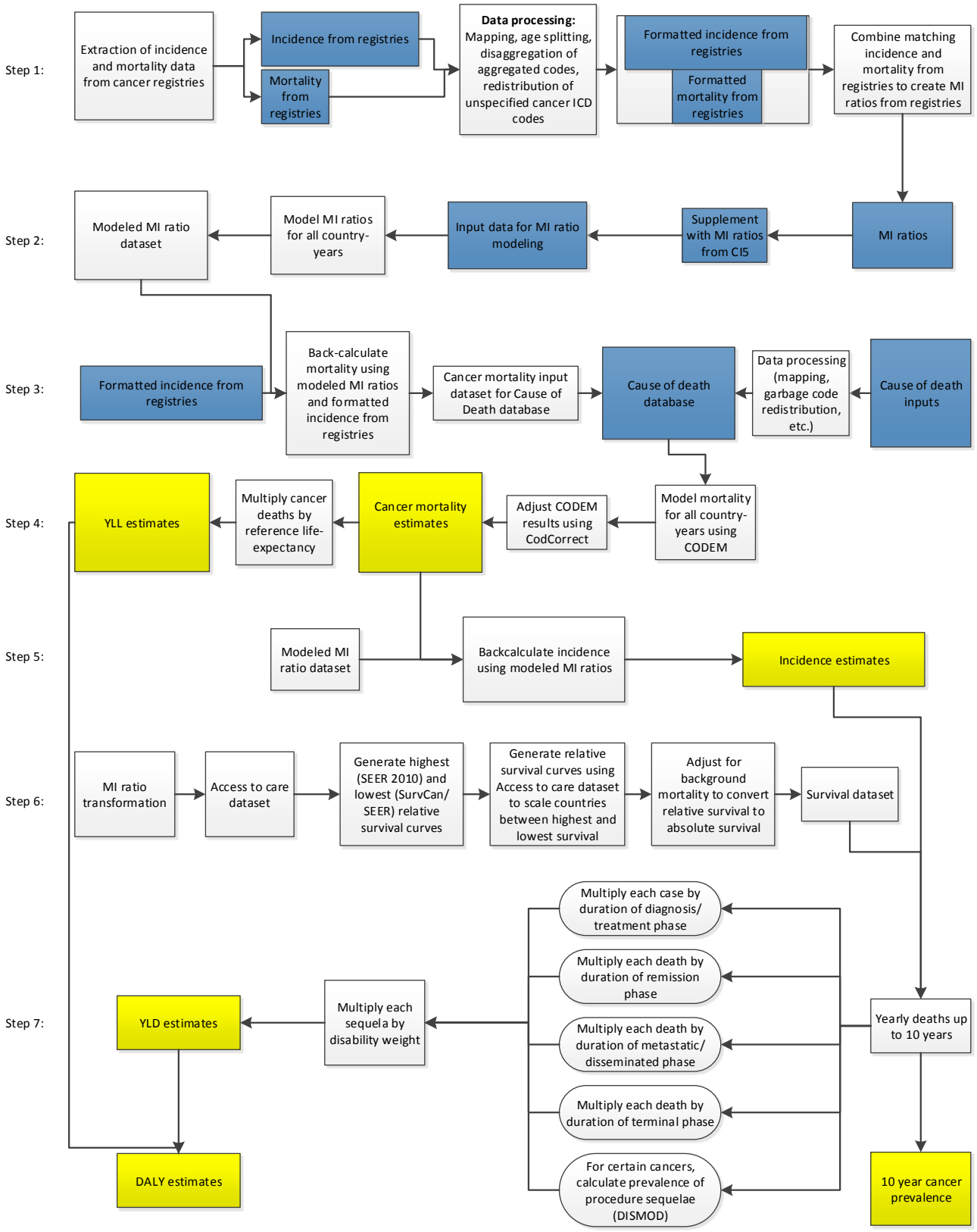
Cancers	Birth to age 49		Age 50 to 59		Age 60 to 69		Age 70 to 79		Birth to age 79	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
All cancers excl. NMSC, KS	2.41% (1 in 42)	3.49% (1 in 29)	4.04% (1 in 25)	3.79% (1 in 26)	9.56% (1 in 10)	5.99% (1 in 17)	16.13% (1 in 6)	8.46% (1 in 12)	28.97% (1 in 3)	20.09% (1 in 5)
Esophageal cancer	0.06% (1 in 1672)	0.03% (1 in 3284)	0.20% (1 in 513)	0.06% (1 in 1542)	0.46% (1 in 217)	0.15% (1 in 676)	0.66% (1 in 151)	0.25% (1 in 399)	1.37% (1 in 73)	0.49% (1 in 203)
Stomach cancer	0.13% (1 in 742)	0.09% (1 in 1136)	0.33% (1 in 299)	0.14% (1 in 701)	0.83% (1 in 121)	0.33% (1 in 306)	1.48% (1 in 68)	0.64% (1 in 157)	2.75% (1 in 36)	1.19% (1 in 84)
Liver cancer	0.23% (1 in 427)	0.06% (1 in 1539)	0.39% (1 in 256)	0.12% (1 in 829)	0.69% (1 in 144)	0.25% (1 in 408)	0.94% (1 in 106)	0.40% (1 in 253)	2.24% (1 in 45)	0.82% (1 in 121)
Larynx cancer	0.04% (1 in 2398)	0.01% (1 in 13680)	0.12% (1 in 840)	0.01% (1 in 7315)	0.22% (1 in 447)	0.03% (1 in 3762)	0.27% (1 in 369)	0.03% (1 in 3270)	0.65% (1 in 153)	0.08% (1 in 1280)
Tracheal, bronchus and lung cancer	0.20% (1 in 506)	0.10% (1 in 1025)	0.69% (1 in 144)	0.26% (1 in 388)	1.81% (1 in 55)	0.62% (1 in 163)	3.03% (1 in 33)	1.01% (1 in 99)	5.63% (1 in 18)	1.97% (1 in 51)
Breast cancer	0.01% (1 in 7022)	1.17% (1 in 86)	0.02% (1 in 6596)	1.22% (1 in 82)	0.03% (1 in 3608)	1.58% (1 in 63)	0.04% (1 in 2634)	1.67% (1 in 60)	0.10% (1 in 1052)	5.53% (1 in 18)
Cervical cancer		0.47% (1 in 212)		0.31% (1 in 319)		0.34% (1 in 293)		0.30% (1 in 333)		1.42% (1 in 70)
Uterine cancer		0.15% (1 in 670)		0.33% (1 in 306)		0.36% (1 in 276)		0.36% (1 in 279)		1.19% (1 in 84)
Prostate cancer	0.05% (1 in 2063)		0.51% (1 in 196)		2.10% (1 in 48)		4.28% (1 in 23)		6.81% (1 in 15)	
Colon and rectum cancer	0.21% (1 in 474)	0.15% (1 in 676)	0.43% (1 in 235)	0.30% (1 in 338)	1.06% (1 in 94)	0.64% (1 in 157)	2.07% (1 in 48)	1.25% (1 in 80)	3.72% (1 in 27)	2.32% (1 in 43)
Lip and oral cavity cancer	0.12% (1 in 831)	0.05% (1 in 1926)	0.20% (1 in 511)	0.08% (1 in 1240)	0.32% (1 in 310)	0.15% (1 in 667)	0.42% (1 in 236)	0.19% (1 in 525)	1.06% (1 in 94)	0.47% (1 in 212)
Nasopharynx cancer	0.06% (1 in 1754)	0.02% (1 in 5305)	0.04% (1 in 2230)	0.01% (1 in 7564)	0.05% (1 in 1914)	0.02% (1 in 6234)	0.04% (1 in 2360)	0.02% (1 in 6277)	0.20% (1 in 509)	0.06% (1 in 1562)
Other pharynx cancer	0.04% (1 in 2347)	0.01% (1 in 11601)	0.11% (1 in 949)	0.02% (1 in 5485)	0.16% (1 in 622)	0.02% (1 in 4139)	0.15% (1 in 658)	0.03% (1 in 3817)	0.46% (1 in 217)	0.08% (1 in 1296)
Gallbladder cancer	0.02% (1 in 6394)	0.02% (1 in 5097)	0.04% (1 in 2710)	0.04% (1 in 2294)	0.09% (1 in 1074)	0.10% (1 in 995)	0.20% (1 in 509)	0.20% (1 in 506)	0.34% (1 in 293)	0.36% (1 in 277)
Pancreatic cancer	0.04% (1 in 2514)	0.02% (1 in 4513)	0.10% (1 in 1040)	0.06% (1 in 1629)	0.24% (1 in 417)	0.16% (1 in 624)	0.43% (1 in 234)	0.34% (1 in 297)	0.80% (1 in 125)	0.58% (1 in 173)
Malignant skin melanoma	0.08% (1 in 1323)	0.10% (1 in 1053)	0.08% (1 in 1263)	0.07% (1 in 1418)	0.15% (1 in 689)	0.10% (1 in 1004)	0.24% (1 in 425)	0.12% (1 in 821)	0.53% (1 in 187)	0.39% (1 in 259)

eTable 17: Probability* of developing cancer within selected age intervals, global, by sex, 2010-2013

Cancers	Birth to age 49		Age 50 to 59		Age 60 to 69		Age 70 to 79		Birth to age 79	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Ovarian cancer		0.13% (1 in 753)		0.15% (1 in 654)		0.21% (1 in 482)		0.24% (1 in 414)		0.73% (1 in 136)
Testicular cancer	0.09% (1 in 1061)		0.01% (1 in 7728)		0.01% (1 in 9099)		0.01% (1 in 8696)		0.13% (1 in 771)	
Kidney cancer	0.06% (1 in 1719)	0.03% (1 in 3396)	0.12% (1 in 830)	0.05% (1 in 1925)	0.26% (1 in 390)	0.10% (1 in 958)	0.38% (1 in 265)	0.17% (1 in 588)	0.81% (1 in 123)	0.36% (1 in 281)
Bladder cancer	0.04% (1 in 2556)	0.01% (1 in 7918)	0.13% (1 in 791)	0.03% (1 in 3248)	0.36% (1 in 278)	0.08% (1 in 1271)	0.84% (1 in 120)	0.17% (1 in 580)	1.36% (1 in 74)	0.29% (1 in 340)
Brain and nervous system cancer	0.15% (1 in 690)	0.12% (1 in 866)	0.09% (1 in 1160)	0.07% (1 in 1533)	0.14% (1 in 735)	0.10% (1 in 982)	0.17% (1 in 578)	0.13% (1 in 771)	0.54% (1 in 185)	0.41% (1 in 243)
Thyroid cancer	0.04% (1 in 2581)	0.17% (1 in 573)	0.03% (1 in 3056)	0.11% (1 in 893)	0.04% (1 in 2239)	0.10% (1 in 966)	0.05% (1 in 1899)	0.11% (1 in 943)	0.17% (1 in 593)	0.50% (1 in 202)
Mesothelioma	0.00% (1 in 34014)	0.00% (1 in 57471)	0.01% (1 in 7634)	0.01% (1 in 15221)	0.04% (1 in 2662)	0.01% (1 in 6775)	0.05% (1 in 1861)	0.01% (1 in 8741)	0.11% (1 in 932)	0.03% (1 in 2898)
Hodgkin Lymphoma	0.07% (1 in 1441)	0.05% (1 in 2125)	0.02% (1 in 5565)	0.01% (1 in 10582)	0.03% (1 in 3948)	0.01% (1 in 7123)	0.03% (1 in 3126)	0.02% (1 in 4878)	0.14% (1 in 691)	0.09% (1 in 1099)
Non-Hodgkin Lymphoma	0.15% (1 in 650)	0.10% (1 in 1036)	0.14% (1 in 723)	0.10% (1 in 1023)	0.26% (1 in 392)	0.18% (1 in 546)	0.43% (1 in 233)	0.29% (1 in 348)	0.97% (1 in 103)	0.66% (1 in 151)
Multiple myeloma	0.02% (1 in 6494)	0.01% (1 in 9533)	0.03% (1 in 2895)	0.03% (1 in 3827)	0.08% (1 in 1228)	0.06% (1 in 1658)	0.14% (1 in 696)	0.10% (1 in 1001)	0.27% (1 in 364)	0.20% (1 in 508)
Leukemia	0.19% (1 in 530)	0.13% (1 in 768)	0.09% (1 in 1066)	0.06% (1 in 1561)	0.18% (1 in 550)	0.11% (1 in 888)	0.33% (1 in 305)	0.19% (1 in 535)	0.79% (1 in 127)	0.49% (1 in 203)

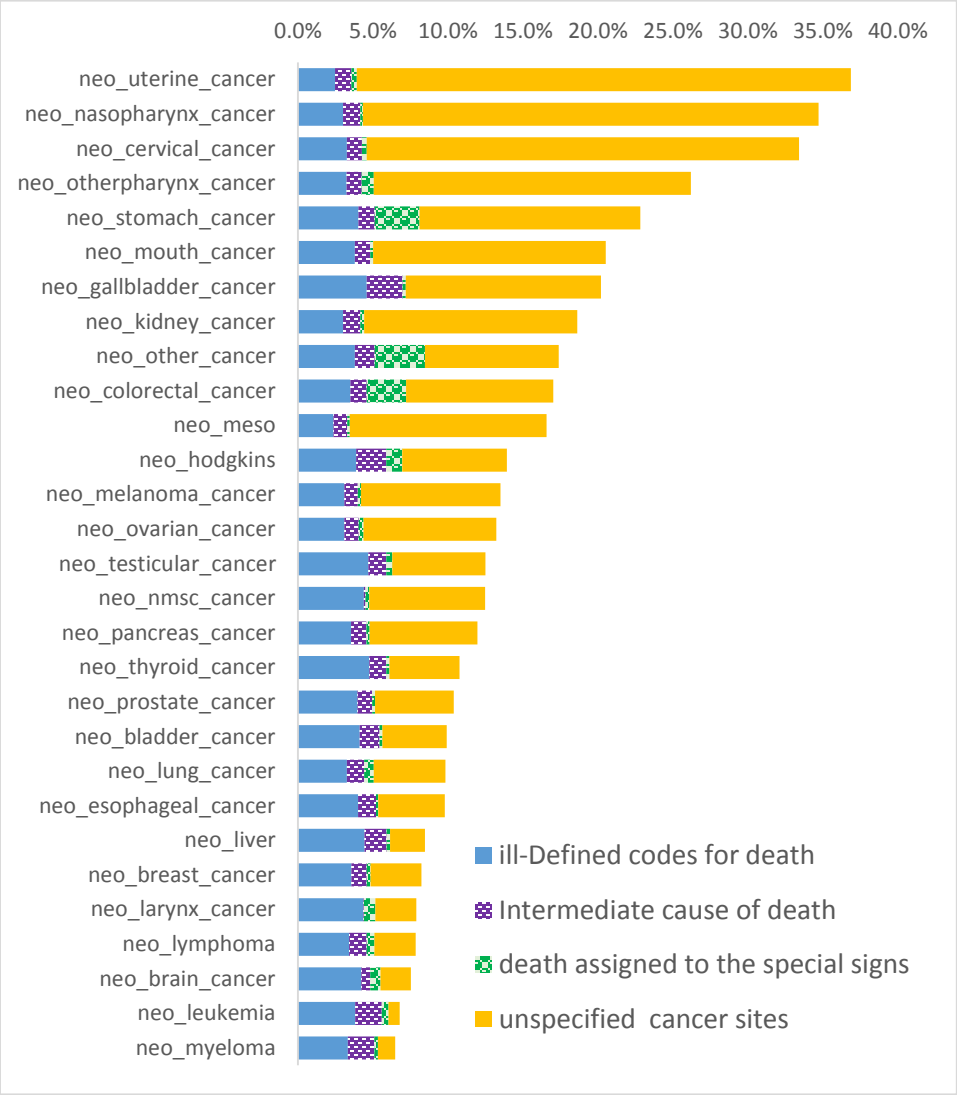
*Conditional probabilities on being alive at the start of each interval. Percentages for the age groups therefore do not add up to the 0-79 age group.

10 APPENDIX FIGURES

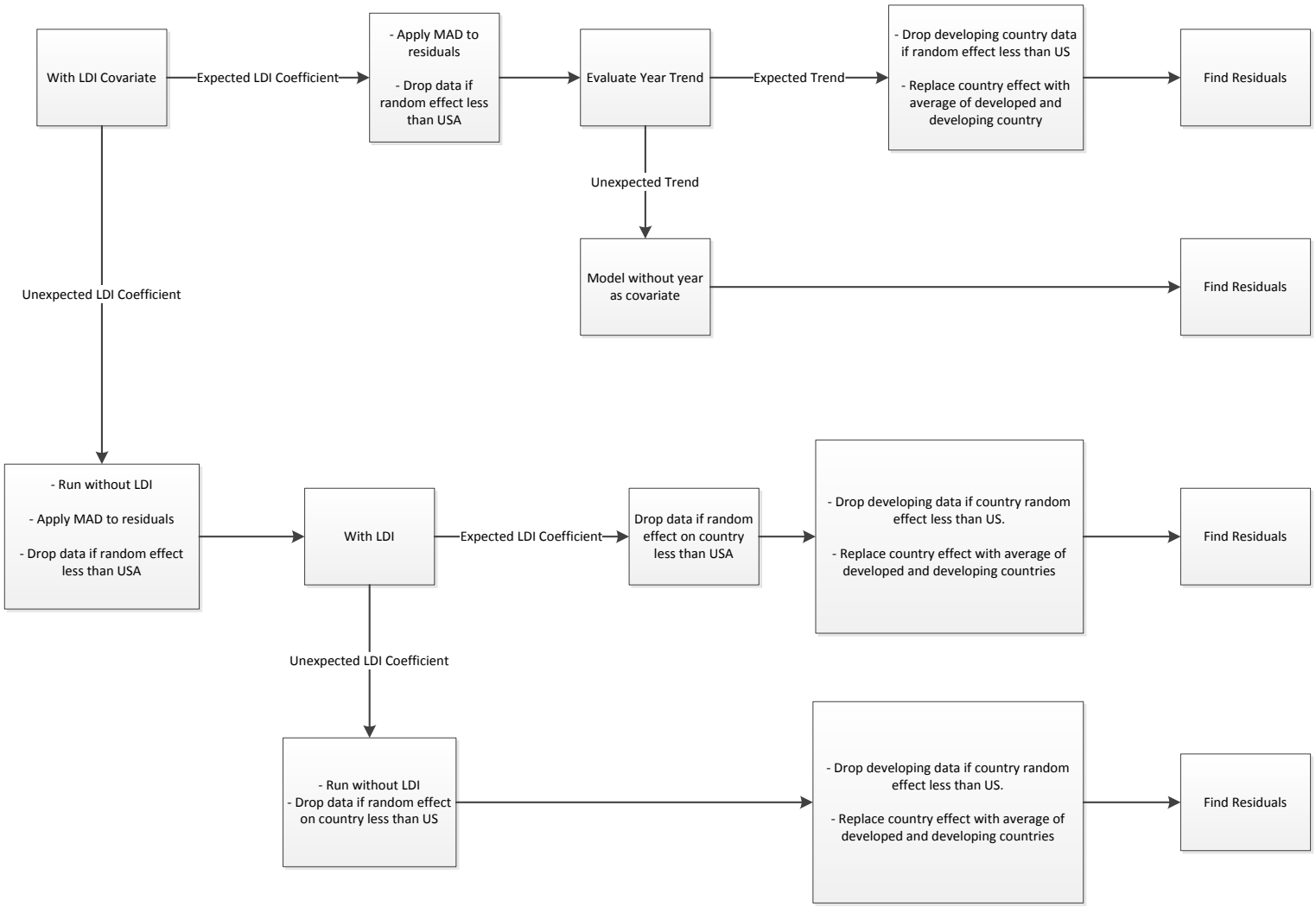


Blue boxes indicate data, yellow boxes indicate estimates.

eFigure 1: Flowchart for GBD cancer estimation process



eFigure 2: Percent increase in mortality by GBD cancer category after redistribution of different categories of garbage code (2008, only countries using ICD-10)



MAD: median absolute deviation; LDI: Lag income per capita; USA, US: United States

eFigure 3: Flowchart of algorithm used to adjust MI ratios

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
Global		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Developed		3	4	2	1	5	11	17	7	20	12	14	6	13	8	16	10	9	15	18	19	22	23	21	24	27	25	26
Developing		1	2	4	6	3	5	7	11	8	10	9	16	13	14	12	20	23	18	15	19	17	21	25	24	22	26	27
Australasia	Australia	3	5	2	1	11	17	20	6	16	9	18	7	12	10	13	8	4	15	19	21	24	23	14	26	27	25	22
	New Zealand	3	5	2	1	9	18	19	6	16	7	17	8	12	10	13	11	4	15	20	21	23	24	14	26	27	22	25
High-income Asia Pacific	Brunei	2	3	1	4	7	10	8	6	25	11	14	13	19	16	15	9	18	12	5	17	22	20	21	24	23	26	27
	Japan	4	2	1	6	3	5	17	10	11	13	14	9	18	7	22	12	23	15	16	8	21	20	19	27	26	25	24
	Singapore	3	2	1	4	5	6	10	7	17	14	11	9	20	8	21	15	24	12	18	13	23	16	22	25	19	26	27
	South Korea	5	2	1	8	3	4	13	10	15	14	18	11	19	9	16	12	23	17	6	7	21	22	20	25	24	27	26
High-income North America	Canada	4	3	2	1	12	18	20	5	19	10	14	6	8	11	13	9	7	15	17	21	22	23	16	24	27	25	26
	United States	2	3	4	1	13	18	20	7	19	11	12	6	9	10	17	8	5	15	14	23	21	22	16	24	27	25	26
Southern Latin America	Argentina	1	4	3	2	5	18	6	8	14	12	16	10	7	9	19	11	15	17	21	13	20	25	23	24	26	22	27
	Chile	2	5	4	1	3	13	7	8	14	15	22	11	12	10	20	9	18	17	16	6	23	25	19	24	27	21	26
	Uruguay	1	4	3	2	5	22	11	7	13	14	15	6	10	9	20	8	18	17	19	12	16	23	21	25	26	24	27
Western Europe	Andorra	4	3	2	1	8	17	22	7	19	11	15	5	13	6	14	9	10	12	18	20	21	23	16	25	27	26	24
	Austria	3	4	2	1	10	13	17	5	22	12	14	6	8	9	16	7	11	15	21	19	24	20	18	25	27	23	26
	Belgium	2	4	3	1	10	20	19	6	16	9	14	5	12	11	15	7	8	13	22	23	18	21	17	25	27	26	24
	Cyprus	2	4	3	1	6	15	16	7	22	8	18	5	11	10	14	13	9	12	19	20	21	25	17	24	27	26	23
	Denmark	4	3	1	2	13	16	20	8	18	11	10	5	14	9	7	12	6	15	24	21	22	19	17	26	27	23	25
	Finland	2	4	3	1	9	16	21	5	20	12	14	8	11	6	13	10	7	15	19	18	22	23	17	25	27	26	24
	France	3	4	2	1	10	14	19	6	18	13	12	5	7	11	16	9	8	17	22	23	21	15	20	24	27	25	26
	Germany	3	4	2	1	6	16	21	9	18	11	15	5	12	8	14	7	10	13	22	17	23	19	20	26	27	24	25
	Greece	2	3	4	1	6	17	16	14	23	7	18	5	12	8	9	11	10	13	21	20	15	24	22	19	26	25	27

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
	Iceland	2	3	4	1	7	19	20	9	18	11	17	5	13	8	10	6	12	15	16	21	25	24	14	22	27	26	23
	Ireland	3	4	2	1	8	19	18	7	14	11	17	6	15	9	13	10	5	12	22	21	20	23	16	25	27	24	26
	Israel	2	4	3	1	11	19	17	7	23	8	18	6	14	9	12	10	5	15	13	22	20	25	16	21	27	24	26
	Italy	2	4	1	3	6	8	21	7	22	11	19	5	12	9	14	10	13	15	18	16	20	24	17	25	27	26	23
	Luxembourg	2	4	1	3	7	16	20	6	17	8	15	5	10	9	14	12	11	13	22	23	21	19	18	25	27	26	24
	Malta	1	4	2	3	9	17	21	8	20	12	15	6	5	7	14	10	13	11	16	23	19	22	18	24	26	27	25
	Netherlands	3	4	1	2	7	21	19	8	13	12	15	5	11	10	16	9	6	14	24	18	20	23	17	26	27	25	22
	Norway	3	4	2	1	10	19	17	7	18	11	15	6	13	8	12	9	5	14	21	20	24	23	16	26	27	22	25
	Portugal	3	4	1	2	5	15	16	7	20	13	10	6	8	9	12	11	14	18	22	23	19	17	21	24	25	26	27
	Spain	4	3	1	2	6	11	20	7	23	12	13	5	8	9	15	10	14	16	22	19	17	21	18	24	27	25	26
	Sweden	3	4	2	1	11	17	19	7	20	10	15	6	8	9	13	12	5	14	21	18	24	22	16	26	27	25	23
	Switzerland	2	4	3	1	11	13	21	6	19	10	12	7	20	8	15	9	5	14	16	18	23	22	17	26	27	24	25
	United Kingdom	4	3	2	1	7	18	19	6	12	11	17	5	14	9	15	10	8	13	24	23	20	22	16	26	27	25	21
Central Asia	Armenia	1	2	3	4	5	6	9	18	20	10	17	11	13	7	8	12	14	16	21	19	15	25	22	23	26	24	27
	Azerbaijan	1	2	5	4	3	10	12	15	11	7	21	17	14	13	6	8	19	18	9	20	16	24	25	22	26	23	27
	Georgia	1	2	4	3	5	6	9	17	23	14	16	15	7	10	8	12	11	19	20	18	13	24	25	21	26	22	27
	Kazakhstan	1	2	3	5	4	10	6	15	7	9	14	11	18	12	20	8	17	16	13	21	19	23	24	22	26	25	27
	Kyrgyzstan	1	4	5	6	2	7	3	18	8	9	13	20	11	12	10	16	17	14	15	22	19	23	26	21	25	24	27
	Mongolia	6	3	7	9	2	1	4	14	5	8	13	19	11	12	10	15	20	16	17	22	18	23	26	21	24	25	27
	Tajikistan	2	8	6	10	1	4	11	14	3	5	12	20	13	16	7	18	9	19	17	21	23	24	26	15	25	22	27
	Turkmenistan	1	4	5	15	3	7	8	14	2	6	11	16	23	18	9	13	12	10	19	17	20	24	26	22	25	21	27
	Uzbekistan	1	3	8	11	2	9	4	12	5	6	10	20	13	16	7	17	18	19	24	21	14	23	25	15	26	22	27
	Albania	3	1	6	2	4	5	10	17	18	8	14	21	11	9	7	13	15	20	16	25	12	23	27	19	26	24	22

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
Central Europe	Bosnia and Herzegovina	3	1	2	4	5	17	10	14	21	11	16	8	13	6	7	9	12	18	20	15	19	23	24	22	26	25	27
	Bulgaria	2	3	1	4	5	11	8	17	21	12	16	6	9	7	10	13	18	15	19	20	14	23	25	24	26	22	27
	Croatia	3	2	1	4	5	14	17	13	21	11	16	6	9	7	10	8	12	15	20	18	19	22	23	26	27	24	25
	Czech Republic	4	2	1	3	8	16	15	11	19	12	18	6	9	7	17	5	10	14	21	13	22	23	20	25	26	24	27
	Hungary	3	2	1	4	6	14	17	11	20	10	9	5	21	7	15	8	12	18	23	13	16	19	22	25	26	24	27
	Macedonia	2	1	3	4	5	14	10	17	23	11	16	7	12	9	8	18	6	15	20	19	13	25	24	21	27	22	26
	Montenegro	2	1	4	3	5	9	12	14	21	16	19	11	13	6	8	10	17	15	18	20	7	25	24	23	26	22	27
	Poland	3	1	2	4	6	19	11	14	20	12	16	5	9	8	13	7	17	10	21	18	15	23	22	25	26	24	27
	Romania	3	1	2	4	7	10	5	17	20	11	6	9	22	8	12	15	16	13	21	19	14	18	23	25	26	24	27
	Serbia	3	1	2	4	5	12	6	17	21	10	16	7	15	8	9	11	14	18	22	19	13	23	24	25	26	20	27
	Slovakia	3	2	1	4	5	19	14	9	20	12	11	8	10	6	17	7	13	16	22	15	21	18	23	25	26	24	27
	Slovenia	3	2	1	4	5	15	17	7	21	12	16	8	11	6	18	10	9	13	23	14	22	19	20	25	27	24	26
Eastern Europe	Belarus	2	1	3	5	4	20	10	14	18	11	8	7	22	12	17	6	15	13	9	19	16	21	23	24	27	25	26
	Estonia	4	3	1	2	5	17	13	12	20	9	15	6	14	7	16	8	11	10	18	19	21	23	22	24	26	25	27
	Latvia	4	2	1	3	5	17	15	13	18	10	12	6	9	7	14	8	16	11	20	22	19	23	21	24	26	25	27
	Lithuania	4	3	2	1	5	20	13	16	19	9	12	6	10	8	14	7	15	11	18	21	17	23	22	24	26	25	27
	Moldova	2	3	1	4	5	8	6	14	22	13	9	17	11	7	10	16	15	18	21	23	12	19	24	20	25	26	27
	Russia	3	2	1	5	4	17	9	14	19	12	11	8	10	7	18	6	16	13	15	21	20	22	24	23	26	25	27
	Ukraine	2	3	1	4	5	21	9	15	20	11	8	10	17	7	14	6	13	12	16	19	18	22	24	23	27	26	25
Andean Latin America	Bolivia	3	7	5	2	1	10	4	11	22	8	21	18	9	12	15	16	13	17	14	6	25	23	19	20	27	24	26
	Ecuador	3	7	4	1	2	11	5	8	22	6	19	23	10	12	13	15	17	16	9	14	24	25	21	18	27	20	26
	Peru	3	6	4	1	2	9	5	7	21	8	18	20	10	12	15	14	17	16	11	13	24	25	19	23	27	22	26

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
Caribbean	Antigua and Barbuda	2	4	3	1	7	15	5	6	16	10	13	21	9	11	20	14	22	12	8	19	18	23	17	24	25	26	27
	Barbados	2	4	3	1	5	15	6	7	16	11	13	20	8	10	21	14	22	12	9	19	18	23	17	24	25	26	27
	Belize	2	5	3	1	7	14	4	6	17	10	13	22	9	12	16	15	20	11	8	21	18	24	19	23	25	26	27
	Cuba	4	2	3	1	7	17	9	10	13	12	8	14	6	11	15	18	22	20	16	23	5	21	19	24	25	26	27
	Dominica	2	4	3	1	5	13	6	7	16	11	12	21	8	9	19	14	22	15	10	20	17	23	18	24	25	26	27
	Dominican Republic	2	4	3	1	5	7	6	13	17	9	8	23	10	12	14	18	21	19	11	22	15	16	20	24	25	26	27
	Grenada	2	5	3	1	7	14	4	6	16	11	12	22	8	10	19	15	21	13	9	20	18	23	17	24	25	26	27
	Guyana	1	7	4	2	10	15	3	6	20	8	13	24	9	12	14	16	18	11	5	22	19	23	17	21	25	26	27
	Haiti	2	7	3	1	4	8	6	5	17	10	14	21	9	11	22	15	13	12	18	19	23	24	20	16	25	26	27
	Jamaica	2	4	3	1	6	14	5	7	15	9	13	20	8	11	18	17	22	12	10	21	19	23	16	24	25	26	27
	Saint Lucia	2	4	3	1	6	14	5	7	16	10	12	21	8	11	20	15	22	13	9	19	18	23	17	24	25	26	27
	SVG[§]	2	4	3	1	7	14	5	6	17	11	12	22	8	10	18	15	20	13	9	21	19	23	16	24	25	26	27
	Suriname	2	5	3	1	7	14	4	6	18	10	13	22	9	11	16	15	21	12	8	20	19	23	17	24	25	26	27
	The Bahamas	2	4	3	1	7	15	6	5	18	10	14	20	8	12	21	13	22	11	9	19	17	23	16	24	25	26	27
	Trinidad and Tobago	2	4	3	1	8	16	6	7	18	11	13	19	5	10	21	14	23	12	9	20	17	22	15	24	25	26	27
Central Latin America	Colombia	2	6	4	1	3	10	5	9	17	7	16	23	13	12	11	20	18	14	8	15	19	25	22	21	26	24	27
	Costa Rica	2	7	4	1	3	10	6	5	19	8	15	21	12	11	14	13	16	17	9	18	22	25	20	23	26	24	27
	El Salvador	4	7	5	3	1	10	2	8	18	9	15	23	12	13	11	17	21	14	6	16	20	22	24	19	26	25	27
	Guatemala	4	9	6	2	1	8	3	12	17	5	15	24	10	13	11	16	19	18	7	14	21	22	26	20	25	23	27
	Honduras	1	4	3	7	2	18	9	17	25	6	19	20	15	13	10	12	8	11	5	14	23	22	21	16	24	27	26
	Mexico	2	7	3	1	5	10	4	9	22	8	18	24	16	12	14	11	20	13	6	17	19	25	23	21	27	15	26
	Nicaragua	3	8	5	1	4	7	2	12	21	6	16	25	17	11	9	15	18	14	10	13	19	24	23	20	26	22	27

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
	Panama	2	6	3	1	4	12	5	9	21	7	13	22	15	11	10	14	17	16	8	20	19	23	18	25	26	24	27
	Venezuela	2	4	5	1	6	13	3	7	19	8	16	22	10	11	17	12	20	15	9	18	14	25	21	23	26	24	27
Tropical Latin America	Brazil	2	4	3	1	5	17	6	11	14	8	10	21	16	12	7	18	13	20	9	22	15	19	23	24	26	25	27
	Paraguay	2	5	4	1	6	17	3	11	14	7	12	22	8	10	15	16	13	18	9	20	19	21	25	23	26	24	27
East Asia	China	5	1	4	9	2	3	12	11	6	8	19	14	7	13	10	20	26	21	17	18	16	25	24	22	15	27	23
	North Korea	4	1	5	11	3	2	7	12	6	9	14	17	8	13	10	22	23	21	20	19	16	25	24	18	15	27	26
	Taiwan	3	2	1	5	6	4	13	7	16	12	9	8	14	11	21	10	24	19	17	20	22	15	23	26	18	25	27
Oceania	FSM±	1	3	4	5	7	11	2	9	15	8	10	24	6	20	22	16	14	25	13	18	26	19	17	21	12	23	27
	Fiji	1	7	3	5	9	8	2	10	11	6	12	15	4	13	21	22	24	26	14	17	18	25	16	19	20	23	27
	Kiribati	1	3	4	8	5	14	2	10	24	6	9	23	7	20	18	12	11	21	16	22	25	15	26	17	13	19	27
	Marshall Islands	1	3	5	4	7	10	2	9	16	8	11	24	6	22	19	13	15	25	12	21	26	18	17	20	14	23	27
	Papua New Guinea	1	3	4	7	6	5	2	12	10	8	11	19	20	13	23	14	21	26	9	16	24	17	15	22	18	25	27
	Samoa	1	8	2	3	6	7	4	10	16	5	22	20	9	12	13	18	14	26	19	25	24	23	21	11	15	17	27
	Solomon Islands	1	3	5	6	7	11	2	9	15	8	10	24	4	23	18	21	14	25	13	16	26	19	20	17	12	22	27
	Tonga	1	3	6	2	5	9	4	7	16	10	14	24	8	11	12	17	19	25	15	21	26	20	13	22	18	23	27
	Vanuatu	1	3	5	4	7	11	2	9	15	8	10	23	6	24	19	20	18	26	12	16	25	17	21	14	13	22	27
Southeast Asia	Cambodia	1	2	4	7	5	9	3	10	17	8	6	19	11	16	13	22	23	15	12	14	18	20	25	24	21	26	27
	Indonesia	1	2	4	7	5	10	3	8	21	11	6	18	13	15	12	19	23	14	9	16	20	22	25	24	17	26	27
	Laos	1	2	4	8	5	9	3	10	20	7	6	22	11	16	12	19	24	14	13	15	17	23	26	18	21	25	27
	Malaysia	1	2	3	4	7	6	10	5	19	8	14	15	12	17	18	16	22	11	9	23	20	21	25	24	13	26	27
	Maldives	1	4	3	6	10	9	11	2	23	7	5	18	15	14	12	16	8	17	19	22	25	20	21	13	27	24	26
	Myanmar	1	2	5	11	12	4	3	9	17	7	6	22	8	15	14	23	24	10	13	16	19	20	25	21	18	26	27

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
	Philippines	1	2	4	3	12	7	5	11	23	6	10	20	9	15	14	18	21	13	8	19	17	22	26	25	16	24	27
	Sri Lanka	1	3	4	5	7	18	11	10	8	14	2	20	16	19	12	9	23	17	6	15	21	13	24	22	25	26	27
	Thailand	3	1	4	5	7	2	6	10	19	11	8	13	17	16	14	18	23	15	12	9	20	21	26	25	22	24	27
	Timor-Leste	1	2	3	8	6	9	4	11	19	5	7	23	12	15	10	24	21	22	14	13	18	17	26	20	16	25	27
	Vietnam	4	2	5	12	3	1	8	6	10	11	7	18	13	17	9	21	25	20	14	19	15	16	26	24	22	23	27
South Asia	Afghanistan	3	2	8	10	1	9	4	12	17	5	14	11	13	18	6	20	23	22	16	21	15	25	24	7	19	26	27
	Bangladesh	3	4	7	11	6	2	8	5	10	9	1	19	17	22	14	23	24	12	26	18	15	13	25	20	16	21	27
	Bhutan	1	4	3	10	7	11	5	8	6	9	2	17	23	20	14	19	26	13	16	18	15	12	25	21	22	24	27
	India	1	6	4	15	5	8	3	11	7	10	2	19	24	22	12	21	16	14	17	20	13	9	25	18	23	26	27
	Nepal	1	4	6	13	7	9	3	12	5	8	2	21	22	17	14	23	25	11	20	16	15	10	24	18	19	26	27
	Pakistan	1	3	6	8	13	12	15	5	4	7	2	9	17	24	14	22	25	11	18	20	10	16	23	19	21	26	27
North Africa and Middle East	Algeria	1	3	2	10	4	15	7	6	23	5	21	14	20	16	8	22	24	17	12	9	18	25	19	13	11	26	27
	Bahrain	1	4	2	5	7	14	15	3	21	6	16	9	13	8	12	11	22	10	17	24	23	26	19	18	25	20	27
	Egypt	1	6	7	3	9	2	11	13	20	4	14	8	15	10	5	16	23	19	12	18	17	24	25	22	26	21	27
	Iran	2	5	6	3	1	9	15	10	4	7	14	12	24	17	8	18	21	19	13	16	11	26	23	20	25	22	27
	Iraq	1	2	5	8	6	7	10	11	19	3	15	14	9	12	4	16	26	17	13	20	18	24	23	21	25	22	27
	Jordan	1	4	2	6	8	14	12	5	22	3	13	10	19	11	7	18	24	15	9	16	21	26	20	25	23	17	27
	Kuwait	1	6	2	5	10	9	14	4	23	3	18	8	13	12	11	15	25	16	7	19	22	26	20	21	24	17	27
	Lebanon	1	3	4	2	6	16	19	5	24	7	18	17	15	12	8	14	23	10	9	22	11	26	20	13	25	21	27
	Libya	1	2	3	4	7	11	9	5	23	6	20	13	21	10	8	12	24	14	16	18	15	26	22	17	19	25	27
	Morocco	1	2	6	3	5	9	4	10	20	8	13	15	11	12	7	21	23	17	16	14	19	25	26	18	22	24	27
	Oman	1	7	3	5	4	8	13	2	16	6	11	12	19	14	10	20	22	17	9	21	24	25	15	18	26	23	27
	Palestine	1	3	2	5	9	8	22	10	23	6	21	13	12	11	4	14	15	18	17	24	19	26	16	7	25	20	27
	Qatar	1	5	2	6	9	7	15	3	21	4	18	14	22	12	10	11	20	17	8	24	19	25	23	16	26	13	27

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
	Saudi Arabia	1	4	2	6	9	3	16	5	17	8	13	14	22	11	7	15	26	18	10	12	19	21	23	24	25	20	27
	Sudan	1	2	4	5	3	8	11	9	15	6	14	10	18	17	7	19	22	20	12	21	16	26	24	13	23	25	27
	Syria	3	5	4	1	2	9	10	7	15	8	20	18	17	14	6	13	26	16	12	19	21	25	23	11	22	24	27
	Tunisia	1	2	3	4	7	21	10	6	25	8	16	5	20	14	12	15	23	17	11	18	9	24	22	19	13	26	27
	Turkey	2	1	3	4	5	13	18	7	24	6	20	10	11	9	8	16	22	14	12	19	15	27	21	23	25	17	26
	United Arab Emirates	1	6	3	8	9	12	16	2	22	4	18	11	19	17	5	13	21	15	7	25	20	26	24	14	23	10	27
	Yemen	1	2	5	8	3	9	6	10	19	4	15	11	12	18	7	22	23	20	13	16	17	26	24	14	21	25	27
Central Sub-Saharan Africa	Angola	1	7	4	2	5	8	3	6	9	10	11	14	12	19	13	15	20	18	21	17	22	25	23	16	26	24	27
	CAR[₸]	2	6	5	3	4	7	1	9	8	11	10	17	14	15	13	20	16	19	22	18	21	24	23	12	25	26	27
	Congo	1	6	4	2	5	7	3	8	9	13	10	12	11	15	14	17	18	16	21	19	22	24	23	20	26	25	27
	DRC[¥]	1	7	5	3	4	6	2	9	8	11	10	16	17	15	12	19	14	20	24	18	21	23	22	13	25	26	27
	Equatorial Guinea	1	9	3	2	6	8	4	5	11	15	13	7	12	17	18	10	21	16	14	19	22	24	25	20	26	23	27
	Gabon	1	7	3	2	5	9	4	6	10	16	12	8	13	15	19	11	21	14	17	18	20	24	23	22	26	25	27
Eastern Sub-Saharan Africa	Burundi	1	9	5	3	7	6	2	8	4	12	10	17	18	16	11	19	13	14	22	20	23	24	21	15	25	26	27
	Comoros	1	9	5	3	8	6	2	7	4	16	10	19	13	15	12	17	14	11	21	22	24	25	20	18	26	23	27
	Djibouti	1	9	4	3	8	7	2	6	5	17	10	18	12	13	15	14	16	11	20	22	23	25	21	19	26	24	27
	Eritrea	2	9	5	4	7	6	1	8	3	13	10	18	14	17	12	20	16	15	21	19	24	25	22	11	26	23	27
	Ethiopia	1	8	4	3	7	6	2	9	5	18	11	21	15	16	10	12	13	19	22	17	25	24	20	14	26	23	27
	Kenya	1	10	5	4	6	9	3	8	2	14	7	15	23	13	12	20	18	11	17	24	16	25	19	21	22	26	27
	Madagascar	1	9	5	3	8	6	2	7	4	13	10	19	16	14	11	18	17	15	21	20	25	24	22	12	26	23	27
	Malawi	4	11	8	5	17	7	1	3	2	15	12	6	20	14	19	9	10	13	18	25	23	26	21	16	24	22	27
	Mauritius	1	4	3	2	5	13	8	12	18	11	7	9	6	10	19	17	22	14	16	21	15	20	24	23	25	26	27
	Mozambique	2	7	4	1	5	6	3	8	10	14	11	19	18	16	9	13	15	20	25	17	24	23	21	12	26	22	27

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
	Rwanda	1	9	4	2	8	6	3	7	5	12	10	19	18	14	11	16	13	15	22	20	23	24	21	17	26	25	27
	Seychelles	2	6	3	1	12	19	5	7	17	16	4	9	18	13	21	8	22	14	15	20	10	11	24	26	23	25	27
	Somalia	2	9	5	3	7	6	1	8	4	12	10	19	15	17	11	16	14	18	22	20	23	24	21	13	26	25	27
	South Sudan	2	9	5	1	8	7	3	6	4	14	10	16	17	18	13	11	19	15	22	20	23	25	21	12	26	24	27
	Tanzania	1	10	4	2	8	5	3	7	6	14	11	21	18	17	9	13	15	19	23	16	25	24	20	12	26	22	27
	Uganda	3	9	6	1	8	7	2	4	5	12	11	16	15	19	21	18	20	10	13	25	24	22	23	14	17	26	27
	Zambia	1	9	4	3	8	6	2	7	5	14	10	19	13	18	11	16	17	15	20	22	23	24	21	12	26	25	27
Southern Sub-Saharan Africa	Botswana	3	4	2	1	11	9	7	5	6	10	8	14	21	12	17	19	13	20	15	24	16	18	22	25	26	23	27
	Lesotho	3	2	6	1	8	9	4	10	5	12	7	17	15	11	19	20	13	16	23	24	14	21	22	18	26	25	27
	Namibia	1	9	5	2	8	15	4	7	13	14	3	20	19	6	16	21	10	17	18	26	12	11	23	22	25	24	27
	South Africa	2	4	3	1	10	11	6	7	5	13	8	15	14	9	21	17	12	16	20	23	18	22	19	24	27	25	26
	Swaziland	2	3	6	1	8	10	4	9	5	11	7	16	14	13	21	17	12	18	19	24	15	22	23	20	26	25	27
	Zimbabwe	4	10	5	2	7	6	1	8	3	15	14	9	16	13	17	22	12	11	19	23	21	24	18	20	26	25	27
Western Sub-Saharan Africa	Benin	3	8	6	4	5	1	2	7	10	12	16	14	9	11	13	20	18	15	21	19	23	25	22	17	26	24	27
	Burkina Faso	1	11	5	4	8	2	3	7	15	13	14	21	6	16	9	12	18	19	22	17	25	24	20	10	26	23	27
	Cameroon	4	8	6	3	5	1	2	7	11	13	18	12	9	14	16	17	19	10	21	20	23	25	22	15	26	24	27
	Cape Verde	6	8	4	2	1	3	5	9	7	10	17	15	14	13	16	19	22	12	21	18	11	25	23	20	26	24	27
	Chad	4	8	6	3	5	1	2	7	12	10	16	14	9	15	13	19	20	17	21	18	23	26	22	11	25	24	27
	Cote d'Ivoire	1	7	8	3	6	4	2	5	10	12	15	11	13	14	19	20	21	9	17	23	18	24	22	16	25	26	27
	Ghana	3	10	5	1	6	4	2	8	13	12	17	15	7	9	11	20	19	14	21	18	25	26	22	16	24	23	27
	Guinea	3	6	8	4	5	1	2	7	20	19	10	9	12	15	14	16	13	11	18	21	25	22	24	17	23	26	27
	Guinea-Bissau	3	8	6	4	5	2	1	7	10	15	17	12	9	14	16	18	19	11	21	20	23	24	22	13	25	26	27
	Liberia	3	8	6	4	5	1	2	7	10	12	17	14	9	11	13	20	18	15	22	19	23	24	21	16	25	26	27

Region	Country	Breast cancer	Tracheal, bronchus and lung cancer	Colon and rectum cancer	Prostate cancer	Stomach cancer	Liver cancer	Cervical cancer	Non-Hodgkin lymphoma	Esophageal cancer	Leukemia	Lip and oral cavity cancer	Bladder cancer	Uterine cancer	Pancreatic cancer	Brain and nervous system cancer	Kidney cancer	Malignant skin melanoma	Ovarian cancer	Thyroid cancer	Gallbladder and biliary tract cancer	Larynx cancer	Other pharynx cancer	Multiple myeloma	Hodgkin lymphoma	Nasopharynx cancer	Testicular cancer	Mesothelioma
	Mali	4	8	5	6	3	1	2	7	12	10	19	9	21	14	13	18	20	17	15	16	22	25	23	11	24	26	27
	Mauritania	3	8	6	4	5	1	2	7	12	13	17	14	9	11	16	19	21	10	20	18	23	25	22	15	26	24	27
	Niger	3	8	6	4	5	1	2	7	10	11	16	15	9	13	12	20	17	18	21	19	23	26	22	14	25	24	27
	Nigeria	3	9	5	4	6	1	2	7	16	11	17	13	8	12	14	18	20	10	21	19	23	25	22	15	26	24	27
	Sao Tome and Principe	1	5	7	2	4	6	3	8	12	14	21	11	10	19	20	13	18	9	16	15	17	25	22	23	27	24	26
	Senegal	3	8	6	4	5	1	2	7	12	10	17	15	9	13	14	20	18	11	21	19	23	25	22	16	26	24	27
	Sierra Leone	3	8	6	4	5	1	2	7	10	11	17	14	9	15	12	20	18	13	21	19	23	25	22	16	26	24	27
	The Gambia	3	8	7	5	6	1	2	4	14	15	13	12	10	11	16	21	19	9	17	24	22	25	20	18	26	23	27
	Togo	3	8	6	4	5	1	2	7	10	11	17	16	9	14	12	20	18	13	21	19	23	26	22	15	25	24	27

[§]Saint Vincent and the Grenadines; [±]Federated States of Micronesia; [₸]Central African Republic; [¥]Democratic Republic of Congo

eFigure 4a: Cancer ranking by total incidence based on global level for developing and developed regions and all countries, both sexes, 2013

Region	Country	Tracheal, bronchus and lung cancer	Stomach cancer	Liver cancer	Colon and rectum cancer	Breast cancer	Esophageal cancer	Pancreatic cancer	Prostate cancer	Leukemia	Cervical cancer	Non-Hodgkin lymphoma	Brain and nervous system cancer	Bladder cancer	Ovarian cancer	Gallbladder and biliary tract cancer	Lip and oral cavity cancer	Kidney cancer	Larynx cancer	Multiple myeloma	Other pharynx cancer	Uterine cancer	Nasopharynx cancer	Malignant skin melanoma	Mesothelioma	Thyroid cancer	Hodgkin lymphoma	Testicular cancer
Global		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Developed		1	3	7	2	4	11	5	6	8	17	9	14	10	13	15	18	12	21	16	22	20	26	19	23	24	25	27
Developing		1	3	2	4	6	5	9	12	8	7	11	10	14	15	16	13	18	17	22	19	21	20	24	26	23	25	27
Australasia		1	6	12	2	4	10	5	3	9	19	7	11	14	15	18	20	13	23	16	22	21	26	8	17	24	25	27
Australasia	Australia	1	7	12	2	4	10	5	3	8	19	6	11	14	15	18	20	13	23	16	22	21	26	9	17	24	25	27
	New Zealand	1	6	12	2	4	10	5	3	9	20	7	11	14	13	17	19	15	23	16	22	18	26	8	21	24	25	27
High-income Asia Pacific	Brunei	1	3	4	2	5	22	11	9	10	7	6	14	16	12	13	15	8	23	18	21	24	20	19	27	17	25	26
	Japan	1	2	4	3	9	7	5	8	11	16	10	18	12	14	6	17	13	23	15	19	20	24	25	22	21	26	27
	Singapore	1	3	4	2	5	12	6	7	11	13	8	18	15	10	9	14	16	21	19	20	22	17	24	25	23	26	27
	South Korea	1	3	2	4	8	7	5	9	11	13	10	14	12	16	6	20	15	18	17	21	22	24	23	25	19	26	27
High-income North America	Canada	1	7	13	2	3	12	5	4	8	20	6	9	10	11	17	18	14	22	15	23	19	25	16	21	24	26	27
	United States	1	9	8	2	3	13	4	5	7	18	6	12	14	10	20	19	11	21	15	22	17	26	16	23	24	25	27
Southern Latin America	Argentina	1	4	8	2	3	7	6	5	11	10	13	16	14	15	12	19	9	17	20	23	18	26	21	24	22	25	27
	Chile	2	1	8	3	6	9	7	5	13	10	12	17	15	14	4	21	11	20	16	23	19	27	18	25	22	26	24
	Uruguay	1	5	15	2	4	7	6	3	12	13	11	17	10	14	9	19	8	16	18	22	20	24	21	26	23	25	27
Western Europe	Andorra	1	6	12	2	5	14	4	3	7	21	8	10	11	9	17	18	13	22	15	23	20	26	16	19	24	25	27
	Austria	1	6	7	2	3	17	4	5	9	18	8	13	12	11	15	19	10	22	16	21	20	26	14	23	24	25	27
	Belgium	1	6	13	2	3	10	5	4	8	20	7	14	9	12	19	18	11	22	15	23	17	26	16	21	24	25	27
	Cyprus	1	5	9	2	3	20	6	4	7	18	8	11	10	12	15	19	13	22	14	24	16	26	17	21	23	25	27
	Denmark	1	9	10	2	4	11	5	3	6	19	12	8	7	13	18	17	14	23	16	20	21	26	15	22	24	25	27
	Finland	1	6	9	2	5	15	3	4	8	21	7	11	14	12	16	19	10	24	13	23	18	26	17	20	22	25	27
	France	1	7	6	2	4	11	5	3	8	20	10	14	9	13	17	16	12	21	15	18	22	25	19	23	24	26	27

Region	Country	Tracheal, bronchus and lung cancer	Stomach cancer	Liver cancer	Colon and rectum cancer	Breast cancer	Esophageal cancer	Pancreatic cancer	Prostate cancer	Leukemia	Cervical cancer	Non-Hodgkin lymphoma	Brain and nervous system cancer	Bladder cancer	Ovarian cancer	Gallbladder and biliary tract cancer	Lip and oral cavity cancer	Kidney cancer	Larynx cancer	Multiple myeloma	Other pharynx cancer	Uterine cancer	Nasopharynx cancer	Malignant skin melanoma	Mesothelioma	Thyroid cancer	Hodgkin lymphoma	Testicular cancer
	Germany	1	6	10	2	3	14	4	5	7	19	11	13	9	12	15	18	8	23	16	20	21	26	17	22	24	25	27
	Greece	1	5	10	2	3	20	6	4	8	15	14	9	7	11	13	21	12	16	17	24	22	25	18	26	23	19	27
	Iceland	1	6	16	2	4	12	5	3	9	19	10	8	11	14	18	21	7	23	13	24	17	26	15	22	20	25	27
	Ireland	1	6	14	2	3	7	5	4	11	17	9	10	15	8	20	18	12	21	13	22	19	26	16	23	24	25	27
	Israel	1	5	11	2	3	16	4	7	8	18	6	10	9	12	19	20	13	21	14	25	17	26	15	23	22	24	27
	Italy	1	3	6	2	4	16	5	7	9	22	10	12	8	13	14	18	11	20	15	23	21	26	17	19	24	25	27
	Luxembourg	1	6	9	2	3	13	4	5	7	19	8	11	12	10	20	18	14	22	15	21	17	25	16	23	24	26	27
	Malta	1	6	13	2	3	14	4	5	10	22	9	12	8	7	20	19	11	18	15	23	16	24	17	21	25	26	27
	Netherlands	1	6	16	2	3	7	5	4	10	21	11	13	8	12	18	20	9	23	14	22	19	26	15	17	24	25	27
	Norway	1	6	16	2	5	15	4	3	7	19	8	11	10	9	18	20	12	24	14	22	17	27	13	21	23	25	26
	Portugal	2	3	8	1	5	12	6	4	9	18	11	10	7	13	19	15	14	16	17	21	20	24	22	26	23	25	27
	Spain	1	3	7	2	5	14	6	4	9	21	10	11	8	12	16	18	13	17	15	22	19	26	20	23	24	25	27
	Sweden	1	6	10	2	4	17	5	3	7	19	8	13	9	11	15	20	12	24	14	22	18	26	16	21	23	25	27
	Switzerland	1	8	7	2	4	14	5	3	9	19	6	13	11	12	17	18	10	24	15	21	20	25	16	23	22	26	27
	United Kingdom	1	7	14	2	3	6	5	4	10	21	8	13	11	9	20	19	12	22	15	23	18	26	16	17	24	25	27
Central Asia	Armenia	1	3	5	4	2	17	6	9	10	11	15	7	8	13	16	18	12	14	22	21	19	25	20	26	23	24	27
	Azerbaijan	1	2	4	5	3	6	8	11	9	12	13	7	17	15	16	19	10	14	25	21	18	26	20	27	22	23	24
	Georgia	1	2	4	5	3	20	8	6	13	10	17	7	12	16	14	19	11	9	23	21	15	26	18	27	25	22	24
	Kazakhstan	1	2	6	3	4	5	7	12	10	8	14	16	13	11	18	15	9	17	22	20	21	25	19	26	23	24	27
	Kyrgyzstan	2	1	4	5	3	7	8	13	9	6	17	10	16	11	19	14	12	18	26	20	15	24	21	27	22	23	25
	Mongolia	3	2	1	6	10	4	7	17	8	5	12	9	18	11	19	14	13	16	25	20	15	21	23	26	22	24	27
	Tajikistan	4	1	3	7	5	2	9	18	6	15	10	8	11	13	16	14	12	20	26	21	19	23	17	27	24	22	25

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	Turkmenistan	3	2	4	6	5	1	8	21	7	11	16	9	14	10	12	15	13	17	25	19	22	20	18	26	27	23	24
	Uzbekistan	2	1	5	7	4	3	10	18	6	9	11	8	16	15	17	12	14	13	24	20	19	23	21	27	26	22	25
Central Europe	Albania	1	2	3	8	5	13	7	4	9	11	16	6	20	17	23	14	12	10	26	21	15	25	19	18	24	22	27
	Bosnia and Herzegovina	1	3	8	2	4	17	5	6	11	16	14	7	9	13	10	18	12	15	22	21	20	25	19	26	24	23	27
	Bulgaria	1	3	7	2	4	18	5	6	12	10	16	8	9	11	19	17	14	13	22	21	15	25	20	27	24	23	26
	Croatia	1	3	7	2	4	15	6	5	9	16	14	8	10	12	13	18	11	17	21	20	22	26	19	23	24	25	27
	Czech Republic	1	6	8	2	4	15	3	5	10	16	14	12	13	11	9	20	7	22	19	21	18	25	17	26	23	24	27
	Hungary	1	5	6	2	4	14	3	7	8	19	15	13	10	16	12	11	9	18	21	17	22	24	20	25	23	26	27
	Macedonia	1	3	8	2	4	20	5	6	10	13	16	7	9	12	15	19	18	11	23	21	17	27	14	26	25	22	24
	Montenegro	1	5	7	2	3	15	6	4	14	16	13	8	10	12	17	19	11	9	21	24	18	26	20	27	23	22	25
	Poland	1	3	12	2	4	16	5	6	11	14	15	8	7	9	13	18	10	17	21	22	19	25	20	26	23	24	27
	Romania	1	3	6	2	4	17	5	7	11	8	16	9	10	12	18	13	15	14	22	19	20	23	21	26	24	25	27
	Serbia	1	4	7	2	3	17	5	6	11	10	16	8	9	12	14	18	13	15	22	21	20	25	19	27	24	23	26
	Slovakia	1	3	7	2	5	14	4	6	10	18	15	8	17	13	11	12	9	20	22	16	19	24	21	27	23	25	26
	Slovenia	1	3	7	2	5	16	6	4	8	19	10	14	9	11	12	20	13	22	18	17	21	26	15	24	23	25	27
Eastern Europe	Belarus	1	2	16	3	4	17	5	7	8	10	14	15	13	9	18	11	6	12	21	20	23	25	19	24	22	26	27
	Estonia	1	3	10	2	5	15	4	6	7	14	13	12	11	9	17	16	8	22	20	21	18	25	19	26	23	24	27
	Latvia	1	3	12	2	5	14	4	6	10	16	13	11	9	7	20	17	8	18	21	22	15	25	19	27	23	24	26
	Lithuania	1	3	12	2	4	13	6	5	8	14	17	11	10	7	19	15	9	18	20	21	16	25	22	26	23	24	27
	Moldova	1	3	5	2	4	18	6	8	12	7	14	9	11	16	20	13	17	10	24	15	19	23	21	27	25	22	26
	Russia	1	3	7	2	4	13	5	6	10	12	16	11	14	9	18	15	8	17	22	21	19	25	20	26	23	24	27

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	Ukraine	1	3	14	2	4	16	5	8	11	10	15	12	9	7	18	13	6	17	23	20	21	25	19	24	22	26	27
Andean Latin America	Bolivia	3	1	6	4	7	19	9	8	10	5	11	12	14	15	2	20	13	24	17	23	16	27	18	25	21	22	26
	Ecuador	3	1	5	4	8	16	9	2	7	6	10	12	17	13	11	21	14	22	20	24	15	27	18	26	19	23	25
	Peru	2	1	6	3	7	17	8	4	9	5	10	12	16	14	11	20	13	22	18	23	15	27	19	24	21	25	26
Caribbean	Antigua and Barbuda	4	5	9	2	3	12	7	1	10	6	8	19	16	11	15	18	17	20	14	21	13	24	23	25	22	26	27
	Barbados	4	5	9	2	3	11	7	1	13	6	8	19	15	10	17	18	16	20	14	21	12	24	23	25	22	26	27
	Belize	2	6	10	3	4	12	8	1	9	5	7	14	18	11	19	17	16	20	15	21	13	22	24	26	23	25	27
	Cuba	1	6	8	3	4	10	5	2	12	11	13	15	9	18	20	16	19	7	17	21	14	23	24	26	25	22	27
	Dominica	3	5	9	2	4	10	6	1	11	7	8	19	15	12	18	17	16	20	14	21	13	23	22	25	24	26	27
	Dominican Republic	2	6	5	3	4	13	8	1	9	7	12	11	21	17	20	10	19	15	18	16	14	22	24	26	23	25	27
	Grenada	4	5	9	2	3	13	7	1	10	6	8	18	16	11	19	17	15	20	14	21	12	23	24	25	22	26	27
	Guyana	4	6	10	2	1	14	9	5	8	3	7	13	19	11	18	17	16	20	15	21	12	22	25	26	23	24	27
	Haiti	6	4	5	2	3	14	10	1	9	8	7	22	19	12	15	16	13	21	17	24	11	25	20	23	26	18	27
	Jamaica	2	5	9	4	3	11	8	1	10	6	7	17	14	12	16	18	19	20	15	21	13	22	24	25	23	26	27
	Saint Lucia	3	5	9	2	4	12	7	1	10	6	8	19	15	11	16	18	17	20	14	21	13	22	23	25	24	26	27
	SVG§	4	5	9	2	3	12	7	1	10	6	8	16	18	11	19	17	15	20	14	21	13	22	24	25	23	26	27
	Suriname	3	6	9	2	4	12	7	1	10	5	8	15	19	11	17	18	16	20	14	21	13	23	24	26	22	25	27
	The Bahamas	4	5	9	3	2	12	7	1	11	6	8	18	19	10	16	17	15	20	14	21	13	23	24	25	22	26	27
	Trinidad and Tobago	4	7	9	3	2	12	6	1	11	5	8	18	15	10	16	17	19	20	14	21	13	22	25	24	23	26	27
Central Latin America	Colombia	2	1	7	3	5	12	9	4	8	6	10	11	15	14	13	18	17	16	19	24	22	25	21	27	20	23	26
	Costa Rica	4	1	6	2	5	12	7	3	8	10	9	11	14	13	16	18	15	19	17	23	21	25	20	27	24	22	26

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	El Salvador	3	1	6	4	9	12	10	5	7	2	8	11	18	14	13	16	15	20	23	21	17	25	24	27	19	22	26
	Guatemala	4	1	3	7	8	13	9	5	6	2	12	10	19	17	11	16	14	18	25	21	15	24	22	27	20	23	26
	Honduras	2	1	10	3	4	25	6	13	5	12	14	7	15	8	9	20	11	24	21	22	18	23	16	26	17	19	27
	Mexico	1	2	3	5	6	15	8	4	9	7	10	13	17	12	14	19	11	16	18	26	22	27	23	25	20	21	24
	Nicaragua	6	1	3	5	8	16	9	4	7	2	12	10	18	13	11	17	14	15	21	22	20	25	23	27	19	24	26
	Panama	3	2	8	4	5	13	9	1	7	6	10	11	18	12	16	17	14	19	15	22	20	24	21	27	23	25	26
	Venezuela	1	2	7	4	5	13	8	3	9	6	10	14	17	11	16	19	12	15	18	23	20	25	21	27	22	24	26
Tropical Latin America	Brazil	1	3	8	2	5	7	6	4	11	9	12	10	13	14	18	15	17	16	20	19	21	25	22	26	23	24	27
	Paraguay	1	3	10	2	6	9	8	4	7	5	11	15	18	13	16	17	14	19	22	20	12	25	21	27	23	24	26
East Asia	China	1	3	2	5	8	4	6	15	7	12	11	9	13	18	14	20	17	19	22	23	16	10	26	21	24	25	27
	North Korea	1	3	2	4	7	5	10	20	6	9	12	8	11	16	14	19	18	17	22	24	15	13	26	25	23	21	27
	Taiwan	1	4	2	3	6	7	5	9	11	12	8	18	13	19	17	10	15	21	20	16	22	14	24	25	23	26	27
Oceania	FSM[±]	2	4	7	5	1	11	14	8	6	3	10	20	21	22	16	12	18	24	15	17	9	13	19	27	26	23	25
	Fiji	4	7	3	2	1	10	11	8	6	5	12	18	16	24	13	15	20	19	14	21	9	17	22	27	26	23	25
	Kiribati	2	4	7	5	1	19	15	17	6	3	8	16	22	20	18	9	13	24	23	14	12	10	11	27	26	21	25
	Marshall Islands	2	4	7	5	1	11	14	8	6	3	10	20	22	21	18	12	17	24	15	19	9	13	16	27	26	23	25
	Papua New Guinea	1	5	2	6	4	8	9	13	7	3	15	19	14	26	10	12	17	24	11	18	22	16	20	21	23	25	27
	Samoa	5	3	2	1	6	11	8	9	4	7	10	12	17	24	23	22	19	26	18	21	16	14	15	27	25	13	20
	Solomon Islands	2	4	7	5	1	11	17	8	6	3	10	19	21	22	14	13	20	24	16	15	9	12	18	27	26	23	25
	Tonga	1	3	6	7	2	14	10	4	9	5	8	13	21	23	17	15	20	24	12	18	11	16	19	27	26	22	25
	Vanuatu	2	4	7	5	1	11	16	8	6	3	9	18	21	23	14	13	19	24	15	17	10	12	20	27	26	22	25

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Southeast Asia	Cambodia	1	2	6	3	4	12	11	16	7	5	9	14	15	13	10	8	19	20	24	18	21	17	23	26	22	25	27
	Indonesia	1	3	6	2	5	14	8	19	7	4	10	9	16	12	13	11	17	20	24	18	21	15	23	25	22	26	27
	Laos	1	2	5	3	6	14	10	18	7	4	8	13	15	11	12	9	17	20	25	19	21	16	24	26	22	23	27
	Malaysia	1	5	3	2	4	13	7	12	6	10	8	17	15	11	18	16	14	21	20	19	23	9	24	27	22	25	26
	Maldives	1	7	5	4	2	18	9	13	6	12	3	10	15	14	21	8	16	24	19	20	23	26	11	22	25	17	27
	Myanmar	1	7	2	4	5	13	11	20	6	3	9	14	15	8	12	10	17	21	25	19	18	16	24	26	22	23	27
	Philippines	1	6	2	4	3	16	8	11	5	7	10	12	19	9	15	13	17	22	23	21	20	14	24	27	18	25	26
	Sri Lanka	1	5	10	4	2	6	13	16	14	12	15	8	19	17	9	3	7	23	20	11	22	21	24	26	18	25	27
	Thailand	2	4	1	3	6	12	9	16	8	5	13	11	15	14	7	10	17	20	24	19	22	18	23	26	21	25	27
	Timor-Leste	1	3	4	2	7	13	9	17	6	5	12	11	15	18	8	10	19	20	24	16	21	14	23	26	22	25	27
	Vietnam	2	3	1	4	11	5	12	14	9	8	6	7	16	22	19	10	21	15	24	13	18	20	26	27	17	25	23
South Asia	Afghanistan	2	1	5	7	3	12	13	14	4	6	10	9	8	18	17	20	16	11	24	23	21	19	26	25	22	15	27
	Bangladesh	2	3	1	8	9	7	19	18	5	10	4	13	14	11	16	6	20	15	24	12	21	17	25	26	27	22	23
	Bhutan	1	3	5	6	4	2	15	20	7	10	9	13	17	12	16	8	19	14	21	11	23	18	26	27	22	24	25
	India	4	1	2	7	5	3	15	20	10	6	11	13	16	12	17	8	19	14	21	9	25	18	22	27	23	24	26
	Nepal	2	3	6	5	4	1	16	20	8	7	11	15	17	10	14	9	19	13	21	12	23	18	25	27	22	24	26
	Pakistan	1	10	5	9	2	3	18	19	8	16	4	13	7	11	15	6	20	12	21	14	22	17	26	27	23	24	25
North Africa and Middle East	Algeria	1	3	9	4	2	18	13	15	5	12	6	8	10	14	7	22	19	16	17	23	24	11	25	26	20	21	27
	Bahrain	2	7	8	3	1	15	4	9	5	14	6	10	13	11	20	17	12	19	16	26	21	22	24	25	23	18	27
	Egypt	2	7	1	8	3	11	9	10	5	14	12	4	6	17	16	18	13	15	23	21	20	27	24	25	19	22	26
	Iran	3	1	9	5	8	2	12	7	4	17	14	6	10	16	13	18	15	11	20	24	26	19	22	27	21	23	25
	Iraq	2	5	4	7	1	15	8	11	3	12	10	6	9	13	17	19	14	16	21	23	18	22	25	27	20	24	26
	Jordan	1	6	11	3	2	16	9	10	4	14	5	8	7	12	13	17	15	19	18	23	22	21	25	27	20	26	24

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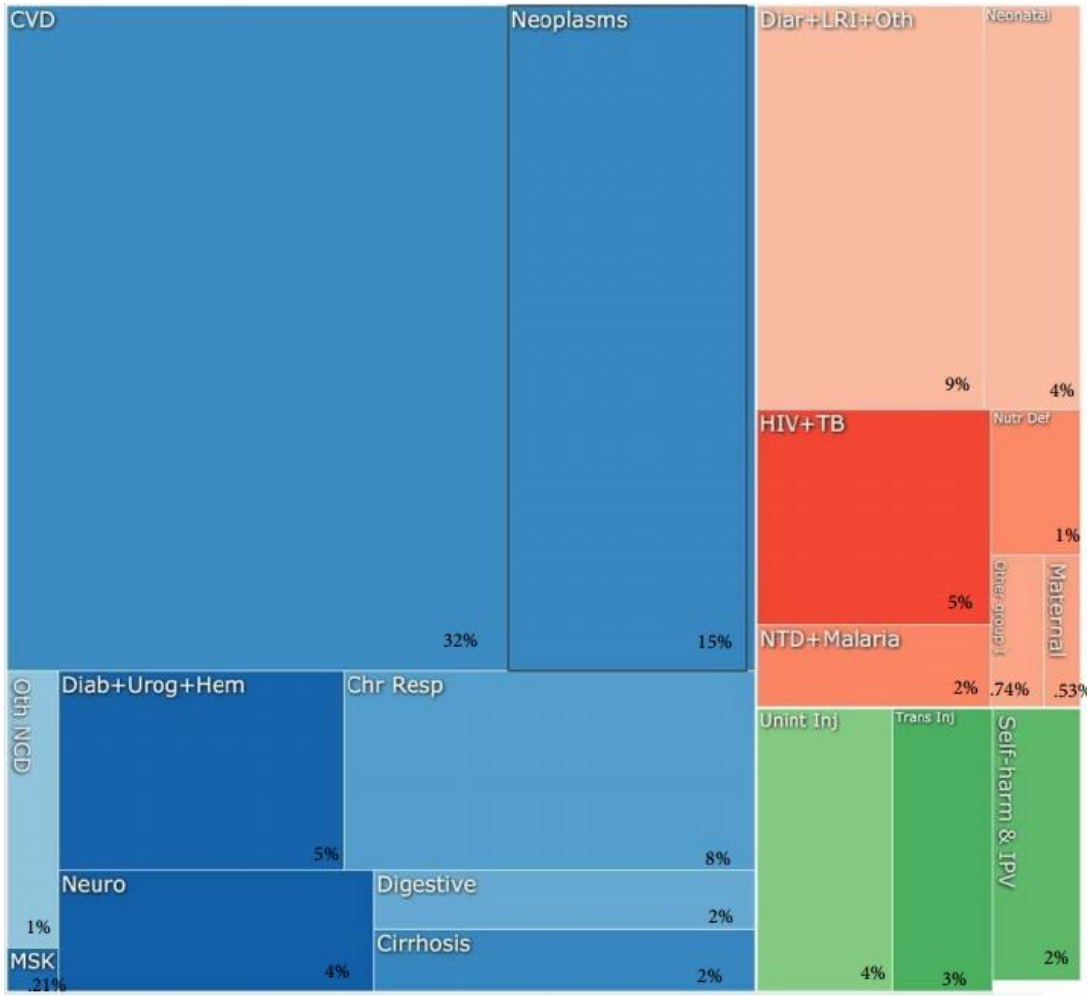
	Kuwait	2	9	5	3	1	13	6	7	4	15	8	10	11	12	16	18	14	19	17	25	21	22	26	27	20	23	24
	Lebanon	1	6	11	2	3	17	7	4	8	18	5	9	14	10	16	22	13	12	15	26	21	23	24	25	20	19	27
	Libya	1	6	4	2	3	19	5	9	8	12	10	7	11	13	16	21	14	15	18	24	23	17	25	26	22	20	27
	Morocco	1	3	5	4	2	15	9	6	10	7	11	8	12	14	13	19	17	16	24	23	18	20	25	26	21	22	27
	Oman	2	1	3	5	4	11	10	8	7	15	6	9	12	14	17	16	18	19	13	23	24	25	22	27	21	20	26
	Palestine	1	7	5	2	3	18	8	9	6	22	10	4	11	15	20	21	13	17	14	26	16	23	19	27	25	12	24
	Qatar	1	8	3	4	2	11	7	10	5	14	6	9	15	13	17	19	12	16	18	22	26	25	21	27	23	20	24
	Saudi Arabia	2	6	1	3	4	12	8	10	7	17	9	5	13	15	11	16	14	18	22	21	25	20	24	27	19	23	26
	Sudan	1	2	6	4	3	12	11	10	5	13	9	7	8	16	15	18	17	14	22	24	23	19	25	27	20	21	26
	Syria	2	1	9	3	8	10	11	5	7	15	6	4	14	12	16	23	13	18	21	24	22	20	25	26	19	17	27
	Tunisia	1	5	15	3	4	21	8	6	9	17	7	12	2	11	16	19	13	10	18	24	23	14	25	26	20	22	27
	Turkey	1	2	10	3	4	16	5	6	7	18	11	8	9	12	15	22	13	14	17	27	19	23	24	21	20	25	26
	United Arab Emirates	1	7	8	2	4	12	9	11	3	15	6	5	10	14	20	18	13	17	21	24	26	19	25	27	23	16	22
	Yemen	1	2	6	5	3	13	12	11	4	10	9	7	8	16	14	18	17	15	23	24	20	19	25	26	21	22	27
Central Sub-Saharan Africa	Angola	6	4	5	3	2	7	10	9	11	1	8	14	13	15	12	17	16	18	19	21	20	24	23	26	25	22	27
	CAR[₸]	3	2	5	4	6	7	10	9	12	1	8	16	11	14	13	15	17	18	20	22	19	24	23	27	25	21	26
	Congo	6	2	5	4	3	7	10	8	12	1	9	15	11	14	13	16	17	18	20	21	19	24	23	27	25	22	26
	DRC[¥]	6	2	5	4	3	7	11	9	10	1	8	14	12	17	13	15	16	18	21	22	20	24	23	27	25	19	26
	Equatorial Guinea	5	6	4	3	2	8	10	7	15	1	9	14	11	16	13	17	12	19	18	20	21	24	22	27	25	23	26
	Gabon	3	2	5	6	1	8	10	7	15	4	9	17	11	12	14	16	13	18	19	21	20	25	22	26	24	23	27
Eastern Sub-Saharan Africa	Burundi	8	6	4	5	3	2	12	9	10	1	7	14	13	11	17	16	15	20	18	21	22	24	23	26	25	19	27
	Comoros	8	5	4	6	3	2	11	9	12	1	7	15	13	10	17	16	14	22	18	21	19	24	23	27	25	20	26

Region	Country	Tracheal, bronchus and lung cancer	Stomach cancer	Liver cancer	Colon and rectum cancer	Breast cancer	Esophageal cancer	Pancreatic cancer	Prostate cancer	Leukemia	Cervical cancer	Non-Hodgkin lymphoma	Brain and nervous system cancer	Bladder cancer	Ovarian cancer	Gallbladder and biliary tract cancer	Lip and oral cavity cancer	Kidney cancer	Larynx cancer	Multiple myeloma	Other pharynx cancer	Uterine cancer	Nasopharynx cancer	Malignant skin melanoma	Mesothelioma	Thyroid cancer	Hodgkin lymphoma	Testicular cancer
	Djibouti	8	6	3	5	4	2	10	9	12	1	7	15	13	11	17	16	14	21	18	22	19	24	23	27	25	20	26
	Eritrea	8	5	3	6	4	2	12	9	10	1	7	14	13	11	16	15	17	21	19	22	20	23	24	27	25	18	26
	Ethiopia	7	6	4	3	5	2	10	9	14	1	8	12	16	17	13	15	11	22	18	21	20	26	23	27	25	19	24
	Kenya	8	4	5	6	3	1	9	11	14	2	7	15	13	10	19	12	18	16	17	22	25	20	24	27	23	21	26
	Madagascar	8	6	3	4	5	2	10	9	11	1	7	14	13	12	17	15	16	22	19	20	21	23	24	27	25	18	26
	Malawi	7	11	5	8	6	1	10	9	13	2	3	17	4	14	22	15	12	21	20	25	24	23	19	27	16	18	26
	Mauritius	1	4	7	2	3	10	6	5	9	8	14	16	13	12	17	11	18	19	21	20	15	22	24	26	23	25	27
	Mozambique	7	3	4	1	5	9	12	6	13	2	8	11	15	18	14	16	10	21	19	20	22	26	23	25	27	17	24
	Rwanda	8	6	4	5	3	2	10	9	11	1	7	14	13	12	17	16	15	20	18	21	22	24	23	27	25	19	26
	Seychelles	2	8	14	3	4	11	7	1	17	5	12	19	16	10	18	6	9	15	24	13	21	20	23	27	22	25	26
	Somalia	7	4	3	6	5	2	10	9	11	1	8	15	12	14	17	16	13	21	19	22	20	24	23	27	25	18	26
	South Sudan	8	4	3	5	6	1	10	9	13	2	7	16	12	14	17	15	11	20	18	21	22	24	23	27	25	19	26
	Tanzania	8	6	2	3	4	5	13	9	12	1	7	10	16	17	14	15	11	22	19	20	21	25	23	26	27	18	24
	Uganda	9	8	4	6	7	2	13	5	11	1	3	20	12	10	24	16	15	21	18	17	23	14	25	27	19	22	26
	Zambia	8	6	3	5	4	2	11	9	10	1	7	14	12	13	17	16	15	22	20	21	19	23	24	26	25	18	27
Southern Sub-Saharan Africa	Botswana	2	9	6	1	5	3	8	4	11	10	7	13	14	18	19	12	21	17	16	15	22	24	20	23	25	26	27
	Lesotho	1	6	8	3	7	2	10	5	11	4	9	17	13	15	21	12	16	14	19	18	20	26	22	25	24	23	27
	Namibia	5	4	11	6	1	9	2	10	13	3	8	16	17	15	23	7	19	14	20	12	22	21	18	26	24	25	27
	South Africa	1	9	8	3	5	2	7	4	11	6	10	17	14	12	21	13	16	20	15	22	19	25	18	23	24	26	27
	Swaziland	1	6	7	4	8	2	10	5	11	3	9	17	14	15	22	12	16	13	19	18	20	24	21	26	25	23	27
	Zimbabwe	10	7	3	4	6	2	11	5	13	1	9	16	8	12	20	17	19	18	14	23	15	25	22	27	21	24	26
	Benin	6	3	1	5	4	9	10	8	12	2	7	14	11	13	16	18	17	21	19	24	15	25	22	26	23	20	27

Region	Country	Tracheal, bronchus and lung cancer	Stomach cancer	Liver cancer	Colon and rectum cancer	Breast cancer	Esophageal cancer	Pancreatic cancer	Prostate cancer	Leukemia	Cervical cancer	Non-Hodgkin lymphoma	Brain and nervous system cancer	Bladder cancer	Ovarian cancer	Gallbladder and biliary tract cancer	Lip and oral cavity cancer	Kidney cancer	Larynx cancer	Multiple myeloma	Other pharynx cancer	Uterine cancer	Nasopharynx cancer	Malignant skin melanoma	Mesothelioma	Thyroid cancer	Hodgkin lymphoma	Testicular cancer
Western Sub-Saharan Africa	Burkina Faso	7	5	1	3	4	9	14	8	11	2	6	13	19	17	15	18	12	22	20	21	10	24	23	27	25	16	26
	Cameroon	8	3	1	5	4	9	10	7	13	2	6	16	11	12	17	18	15	21	20	23	14	25	22	26	24	19	27
	Cape Verde	6	1	2	4	8	3	10	7	11	5	9	17	14	12	15	19	18	13	20	24	16	25	23	26	22	21	27
	Chad	7	3	1	5	4	9	12	8	11	2	6	15	10	14	13	19	17	21	20	24	16	25	22	26	23	18	27
	Cote d'Ivoire	5	4	2	8	3	10	11	7	13	1	6	15	12	9	17	20	16	14	18	22	21	24	25	26	23	19	27
	Ghana	9	3	1	6	5	10	7	4	14	2	8	15	12	11	16	19	17	25	18	24	13	23	21	26	22	20	27
	Guinea	4	3	1	9	5	13	11	8	15	2	7	12	6	10	18	14	16	25	24	20	17	21	19	26	22	23	27
	Guinea-Bissau	5	3	1	6	4	8	11	9	13	2	7	17	10	12	15	18	16	21	20	24	14	25	22	26	23	19	27
	Liberia	6	3	1	5	4	9	10	8	12	2	7	16	11	13	14	18	17	21	19	24	15	25	22	26	23	20	27
	Mali	6	2	1	5	4	10	11	13	9	3	7	16	8	14	12	19	15	17	23	22	21	24	25	27	20	18	26
	Mauritania	6	3	1	5	4	10	9	8	13	2	7	16	12	11	14	19	17	21	20	24	15	25	23	26	22	18	27
	Niger	7	3	1	5	4	9	10	8	11	2	6	15	12	14	13	18	17	21	20	24	16	25	22	26	23	19	27
	Nigeria	7	3	1	5	4	10	9	8	13	2	6	15	11	12	14	18	17	21	20	23	16	25	22	26	24	19	27
	Sao Tome and Principe	3	1	4	7	5	11	17	6	14	2	8	20	9	10	15	22	13	16	19	24	12	27	21	23	18	25	26
	Senegal	7	3	1	5	4	9	10	8	13	2	6	16	11	12	15	18	17	21	19	24	14	25	23	26	22	20	27
	Sierra Leone	6	3	1	7	4	9	11	8	12	2	5	14	10	13	16	18	17	21	20	24	15	25	22	26	23	19	27
	The Gambia	6	3	1	7	5	9	8	13	12	2	4	14	11	10	20	16	17	21	15	23	18	24	25	27	22	19	26
	Togo	7	3	1	5	4	9	10	8	11	2	6	15	12	13	14	18	17	21	20	24	16	25	22	26	23	19	27

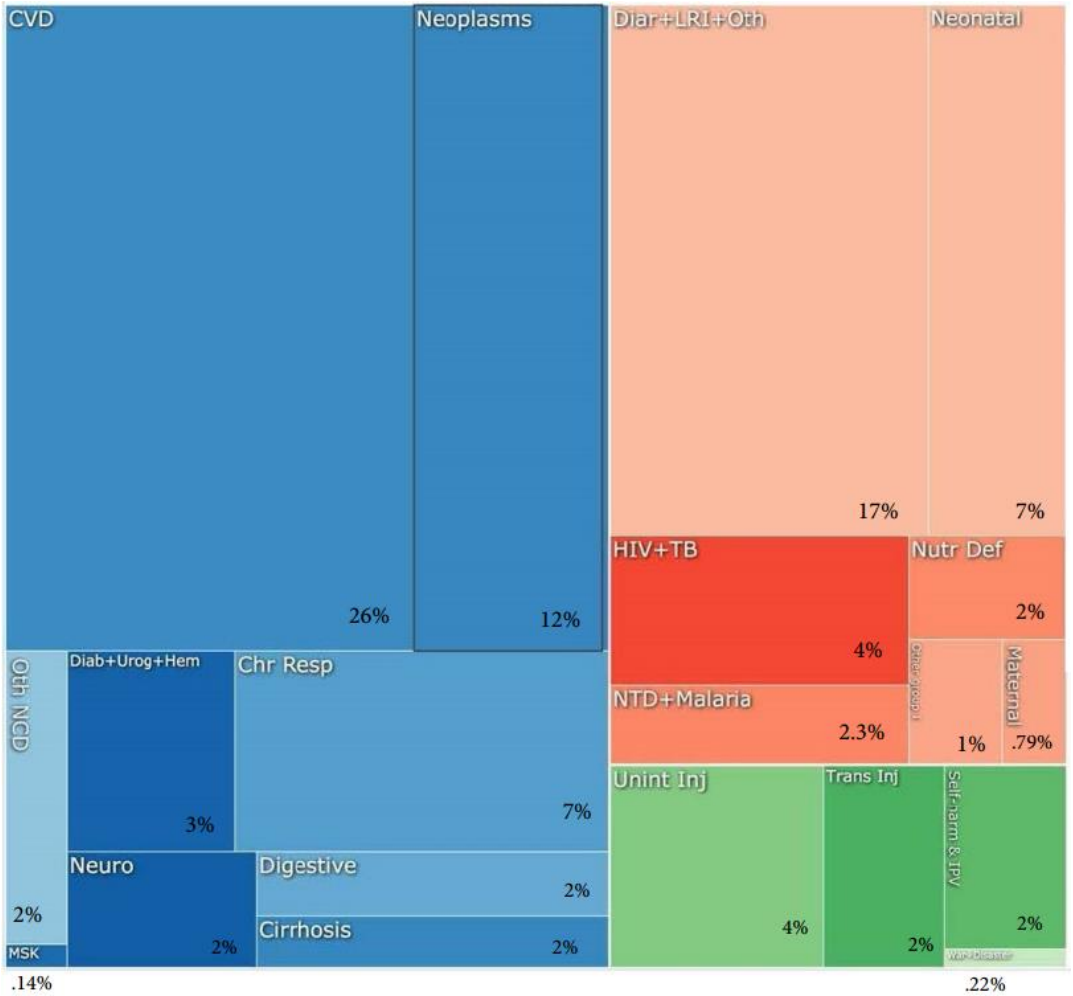
§Saint Vincent and the Grenadines; ±Federated States of Micronesia; ŦCentral African Republic; ¥Democratic Republic of Congo

eFigure 4b: Cancer ranking by total deaths based on global level for developing and developed regions and all countries, both sexes, 2013



Non-Communicable	Injury	Communicable, maternal;, neonatal and nutritional
Chr Resp Chronic respiratory diseases	**Unint Inj** Unintentional injuries	**Diar+LRI+Oth** Diarrhea, lower respiratory, and other common infectious diseases
CVD Cardiovascular diseases	**Trans Inj** Transportation injuries	**HIV+TB** HIV/AIDS and tuberculosis
Diab+Urog+Hem Diabetes, urogenital, blood, and endocrine diseases	**Self-harm & IPV** Self-harm and interpersonal violence	**NTD+Malaria** Neglected tropical diseases and malaria
Mental Mental and substance use disorders		**Other group I** Other communicable, maternal, neonatal, and nutritional diseases
MSK Musculoskeletal disorders		
Neuro Neurological disorders		
Nutr Def Nutritional deficiencies		
Oth NCD Other non-communicable diseases		

eFigure 5a: Proportion of deaths due to underlying causes, global, both sexes, all ages, 2013. Non-communicable causes are shown in blue, communicable, maternal, neonatal and nutritional causes are shown in red, and injury causes are shown in green



Non-Communicable	Injury	Communicable, maternal;, neonatal and nutritional
Chr Resp Chronic respiratory diseases	**Unint Inj** Unintentional injuries	**Diar+LRI+Oth** Diarrhea, lower respiratory, and other common infectious diseases
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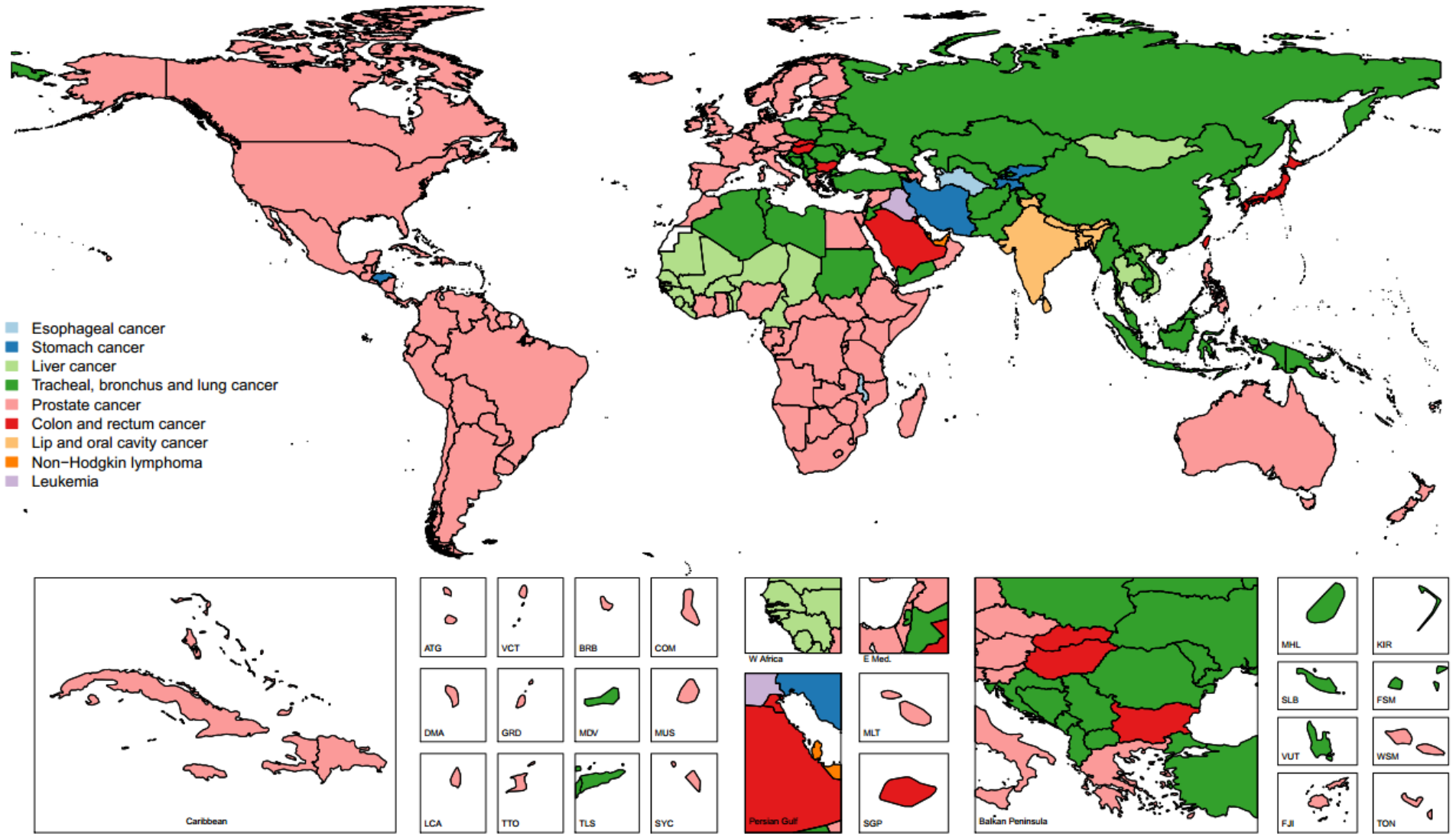
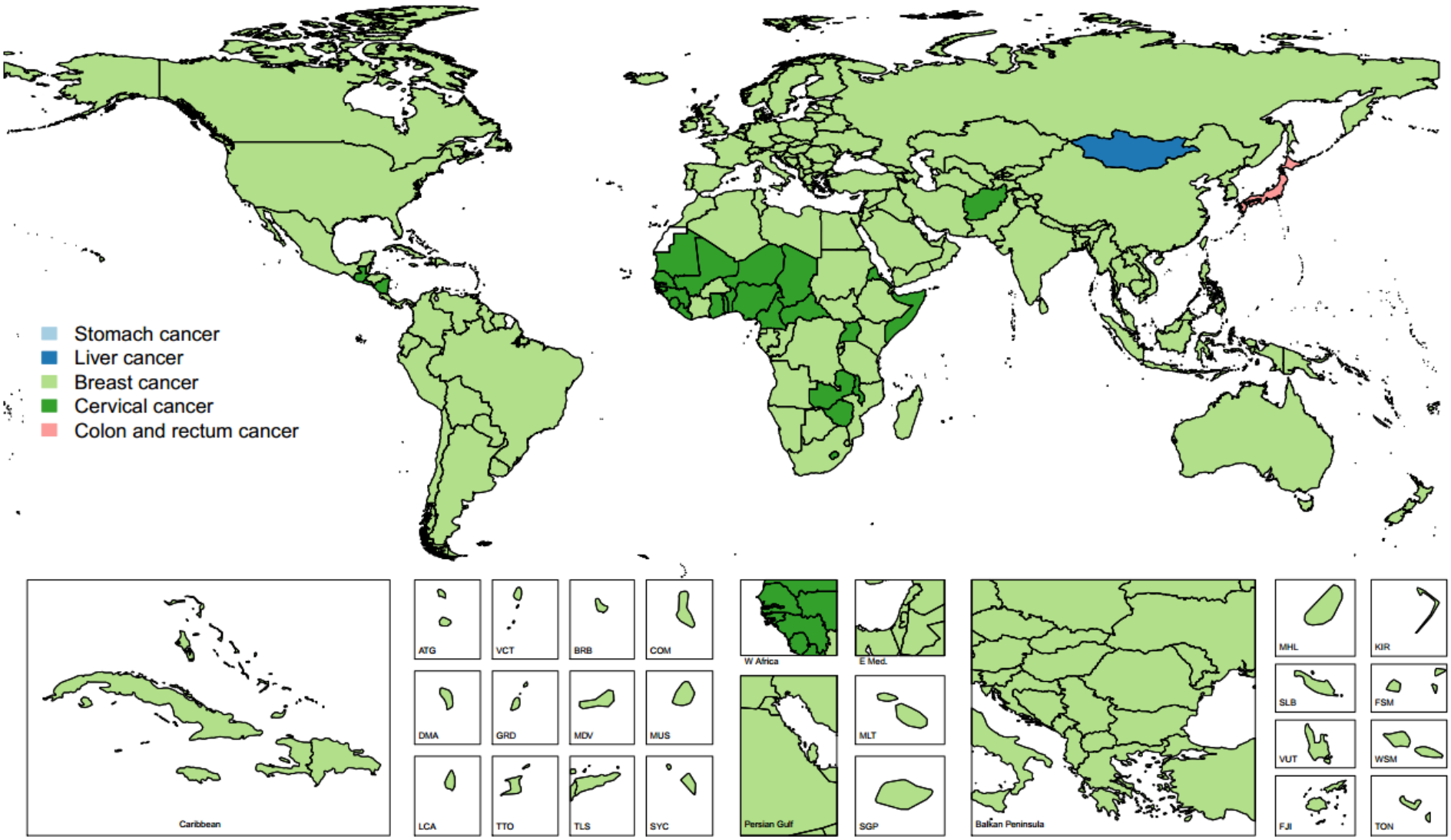
Mental Mental and substance use disorders		**Other group I** Other communicable, maternal, neonatal, and nutritional diseases
MSK Musculoskeletal disorders		
Neuro Neurological disorders		
Nutr Def Nutritional deficiencies		
Oth NCD Other non-communicable diseases		

eFigure 5b: Proportion of deaths due to underlying causes, global, both sexes, all ages, 1990. Non-communicable causes are shown in blue, communicable, maternal, neonatal and nutritional causes are shown in red, and injury causes are shown in green



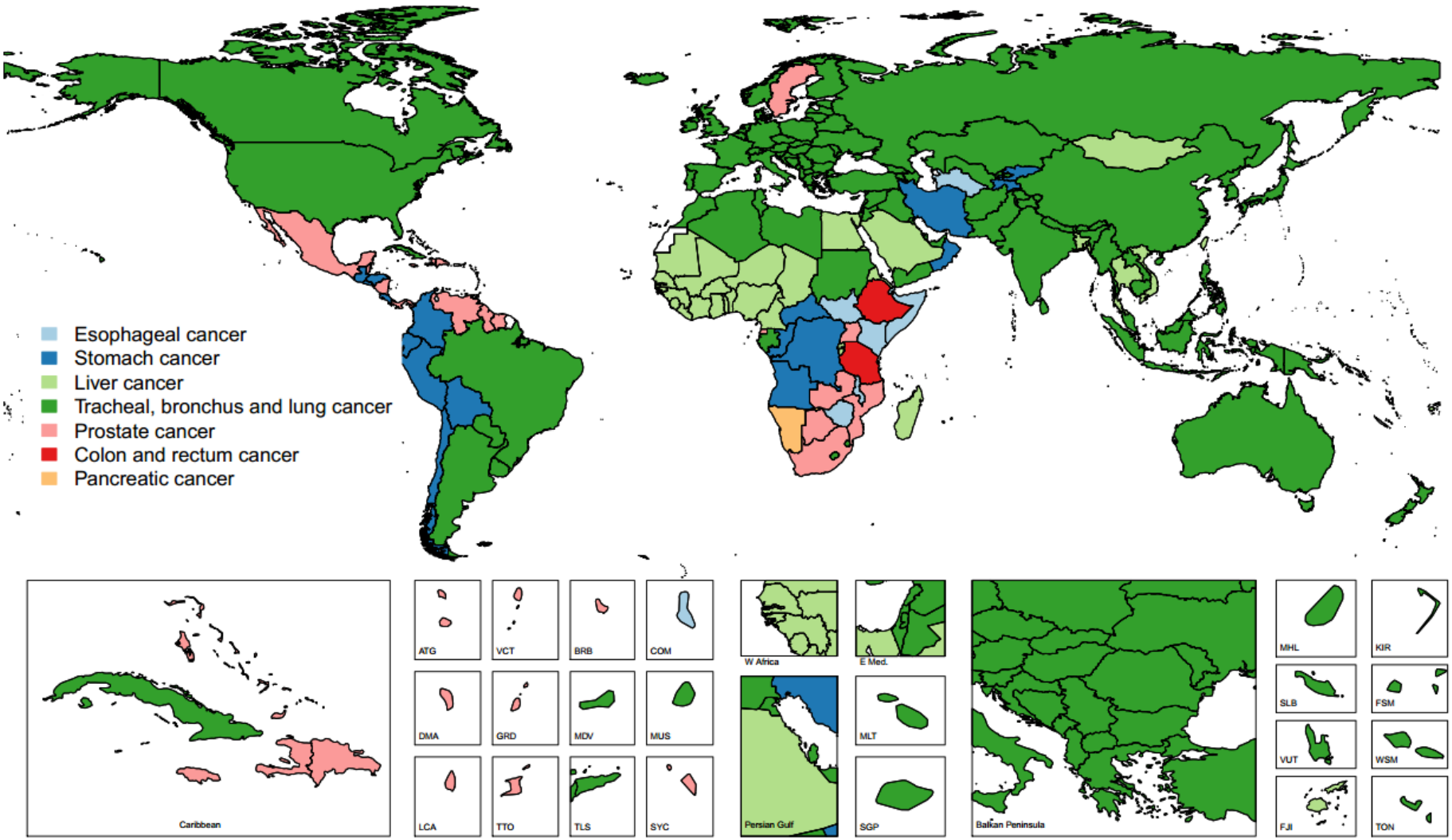
ATG: Antigua and Barbuda; DMA: Dominica: LCA: Saint Lucia; VCT: Saint Vincent and the Grenadines; GRD: Grenada; TTO: Trinidad and Tobago; BRB: Barbados; MDV: Maldives; TLS: Timor-Leste; COM: Comoros; MUS: Mauritius; SYC: Seychelles; W Africa: West Africa; E. Med: Eastern Mediterranean; MLT: Malta; SGP: Singapore; MHL: Marshall Islands; SLB: Solomon Islands; VUT: Vanuatu; FJI: Fiji; KIR: Kiribati; FSM: Federated States of Micronesia; WSM: Samoa; TON: Tonga

eFigure 6a: Top ranked cancers by absolute cases for all ages in males, 2013



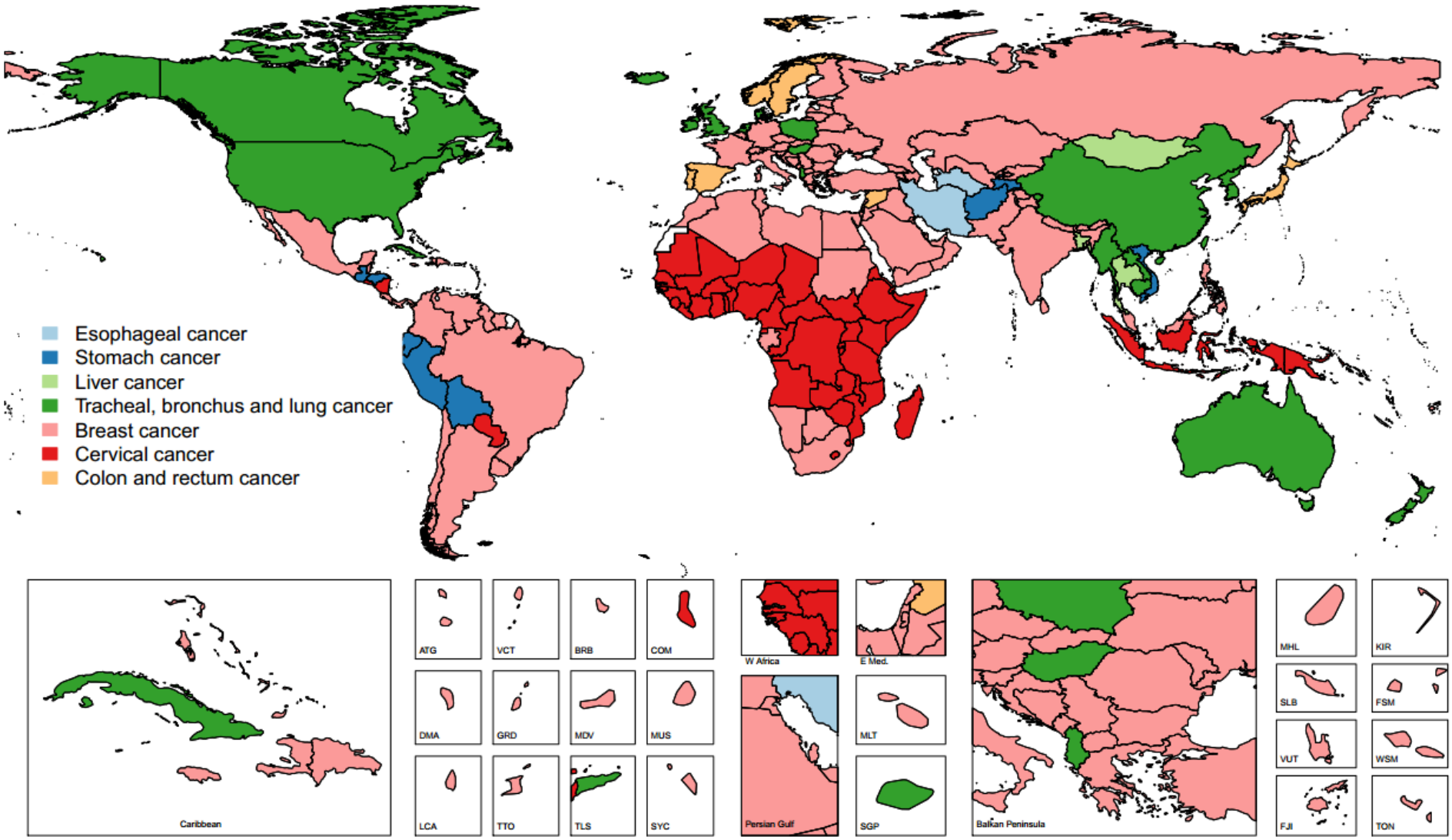
ATG: Antigua and Barbuda; DMA: Dominica: LCA: Saint Lucia; VCT: Saint Vincent and the Grenadines; GRD: Grenada; TTO: Trinidad and Tobago; BRB: Barbados; MDV: Maldives; TLS: Timor-Leste; COM: Comoros; MUS: Mauritius; SYC: Seychelles; W Africa: West Africa; E. Med: Eastern Mediterranean; MLT: Malta; SGP: Singapore; MHL: Marshall Islands; SLB: Solomon Islands; VUT: Vanuatu; FJI: Fiji; KIR: Kiribati; FSM: Federated States of Micronesia; WSM: Samoa; TON: Tonga

eFigure 6b: Top ranked cancers by absolute cases for all ages in females, 2013



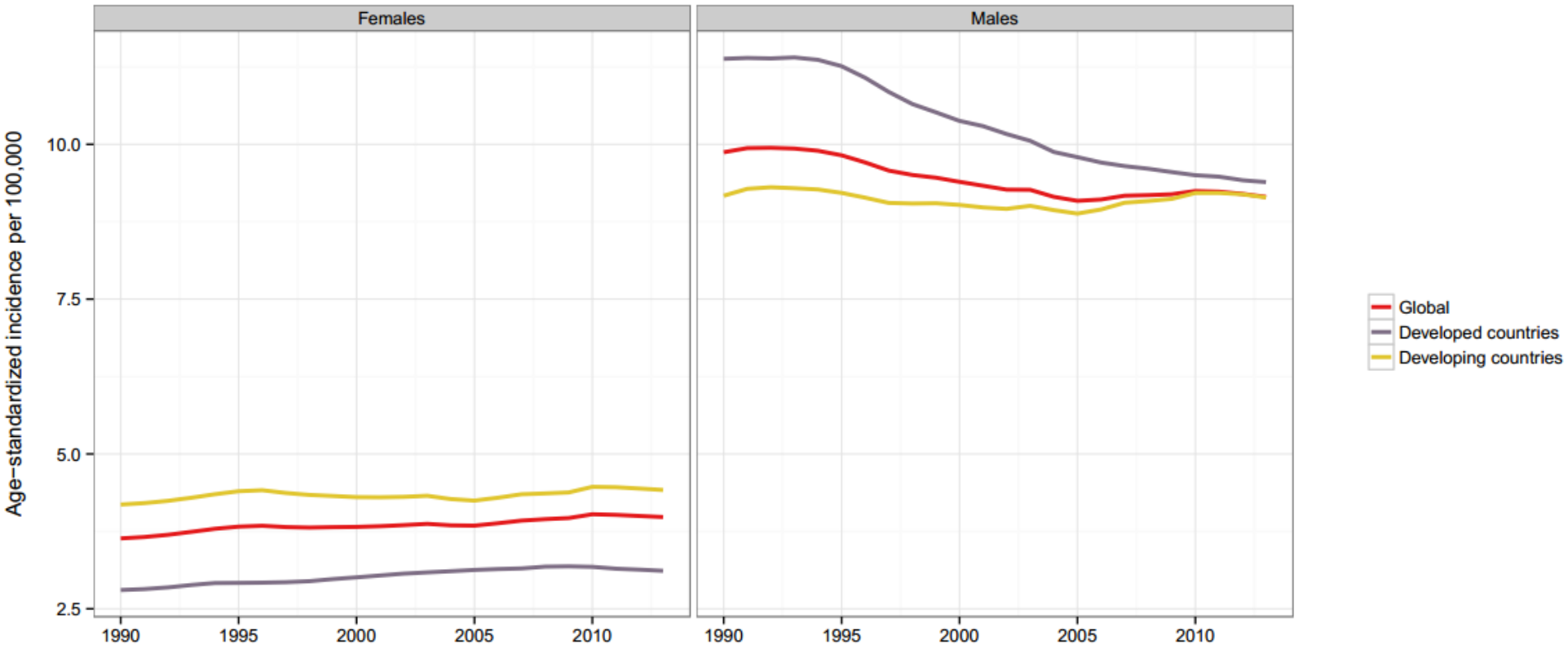
ATG: Antigua and Barbuda; DMA: Dominica: LCA: Saint Lucia; VCT: Saint Vincent and the Grenadines; GRD: Grenada; TTO: Trinidad and Tobago; BRB: Barbados; MDV: Maldives; TLS: Timor-Leste; COM: Comoros; MUS: Mauritius; SYC: Seychelles; W Africa: West Africa; E. Med: Eastern Mediterranean; MLT: Malta; SGP: Singapore; MHL: Marshall Islands; SLB: Solomon Islands; VUT: Vanuatu; FJI: Fiji; KIR: Kiribati; FSM: Federated States of Micronesia; WSM: Samoa; TON: Tonga

eFigure 6c: Top ranked cancers by absolute death for all ages in males, 2013

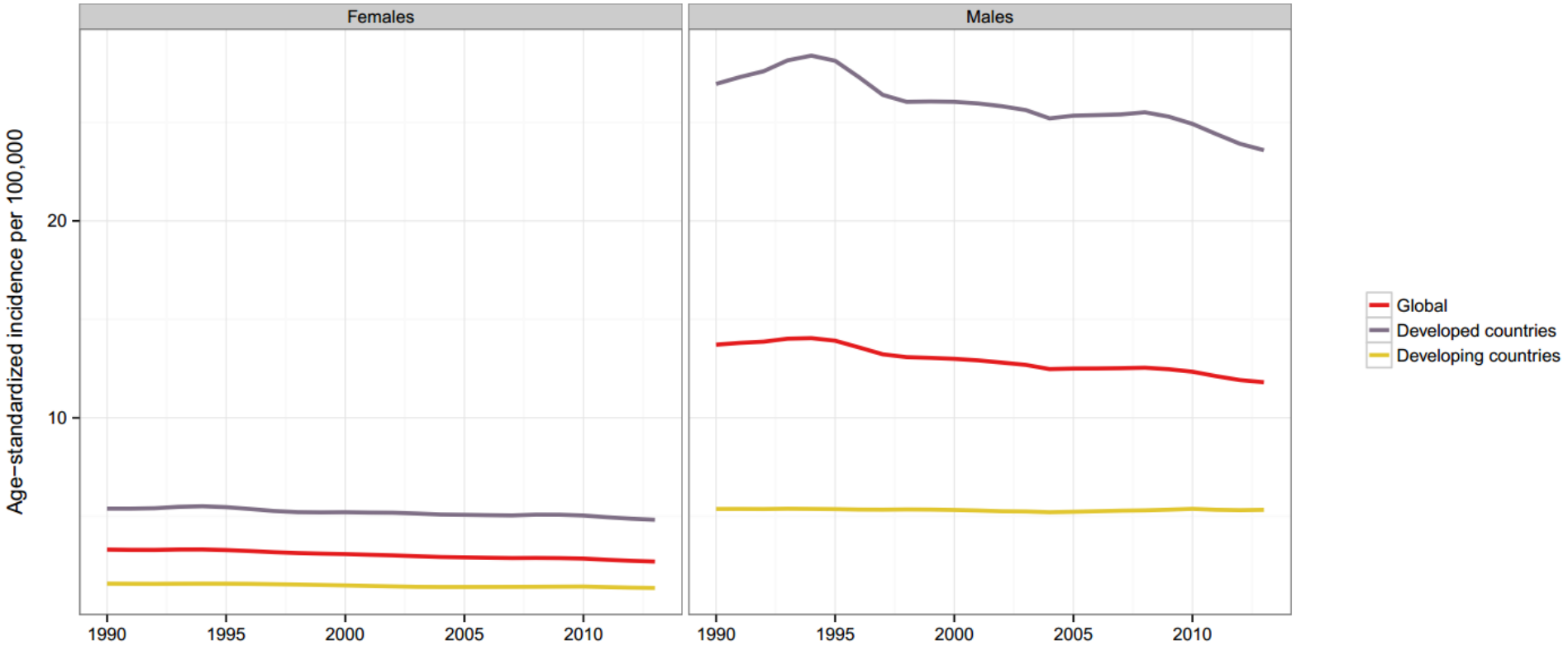


ATG: Antigua and Barbuda; DMA: Dominica: LCA: Saint Lucia; VCT: Saint Vincent and the Grenadines; GRD: Grenada; TTO: Trinidad and Tobago; BRB: Barbados; MDV: Maldives; TLS: Timor-Leste; COM: Comoros; MUS: Mauritius; SYC: Seychelles; W Africa: West Africa; E. Med: Eastern Mediterranean; MLT: Malta; SGP: Singapore; MHL: Marshall Islands; SLB: Solomon Islands; VUT: Vanuatu; FJI: Fiji; KIR: Kiribati; FSM: Federated States of Micronesia; WSM: Samoa; TON: Tonga

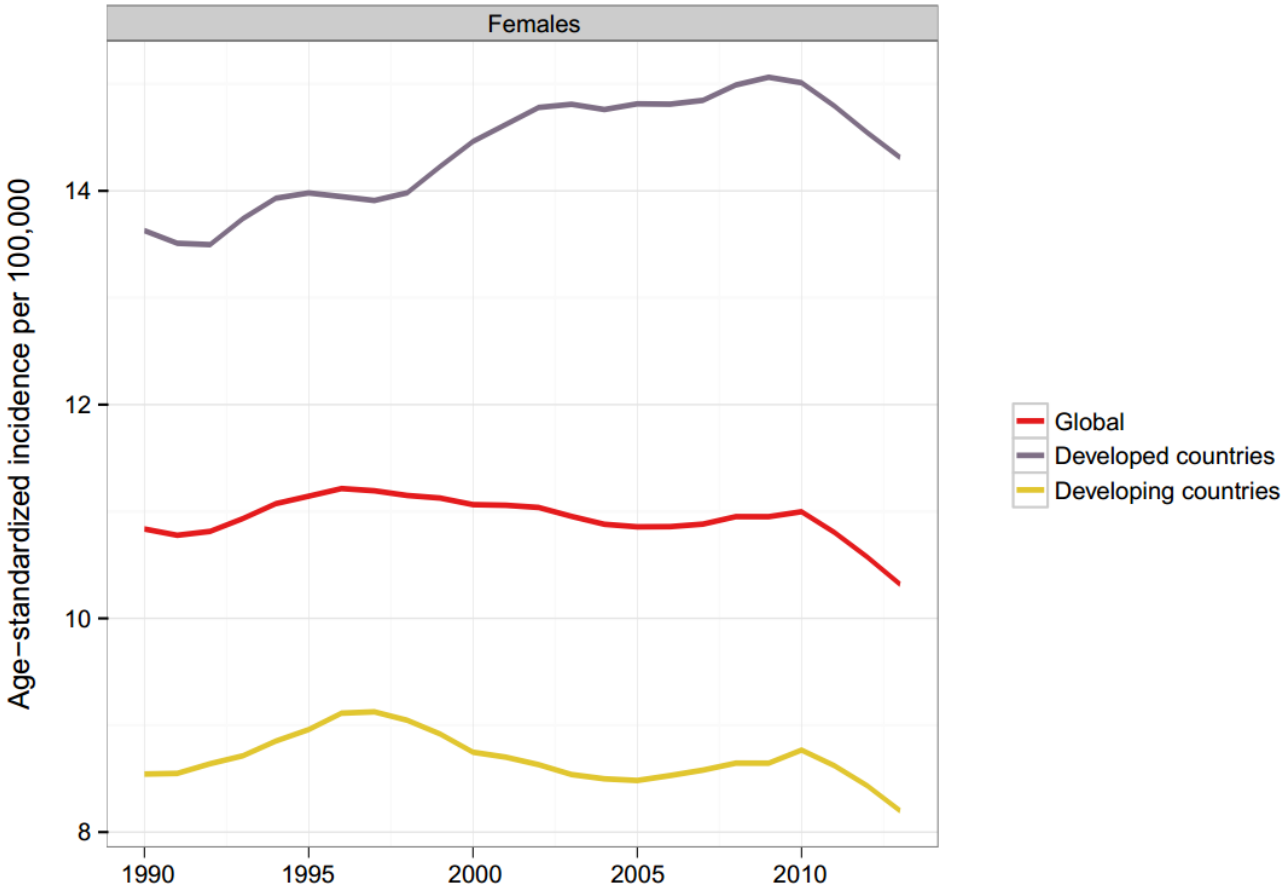
eFigure 6d: Top ranked cancers by absolute death for all ages in females, 2013



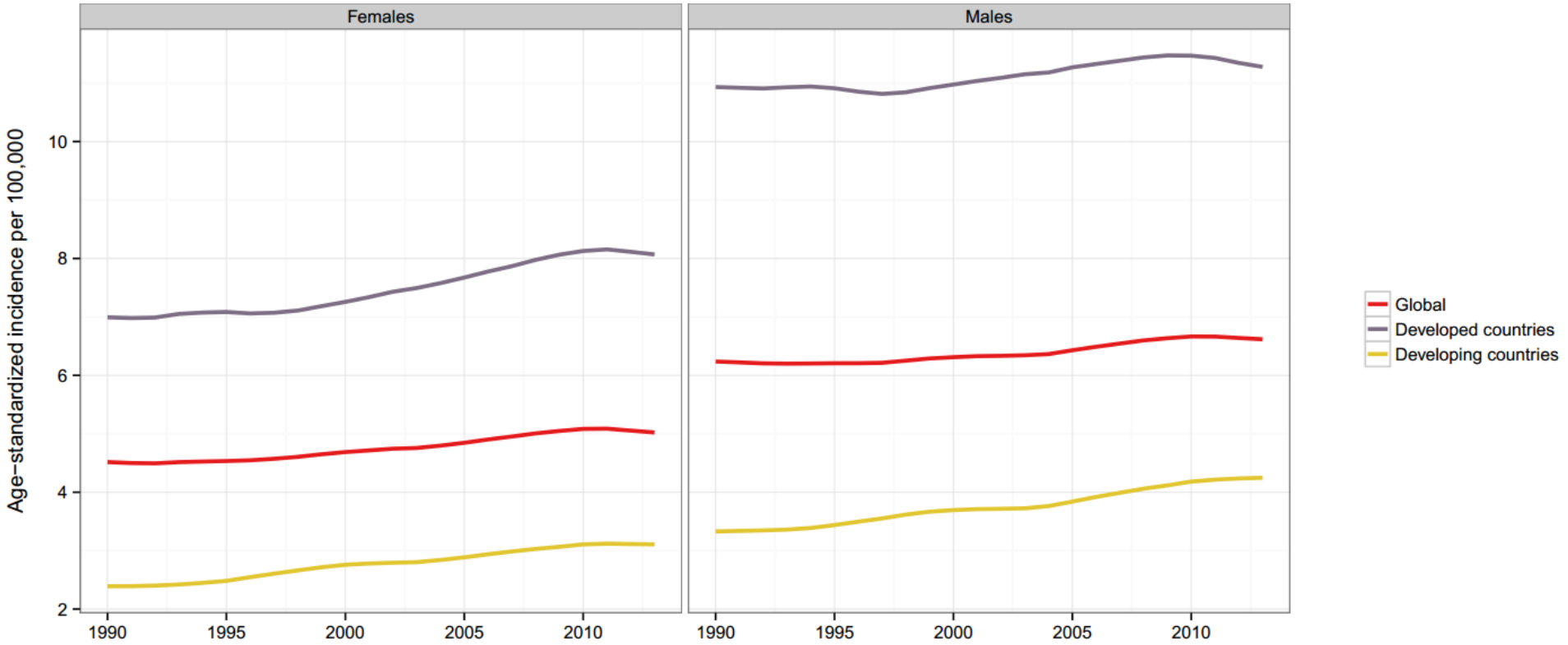
eFigure 7: Trends in age-standardized incidence rates for lip and oral cavity cancer, females and males, global level, developed and developing countries, 1990-2013



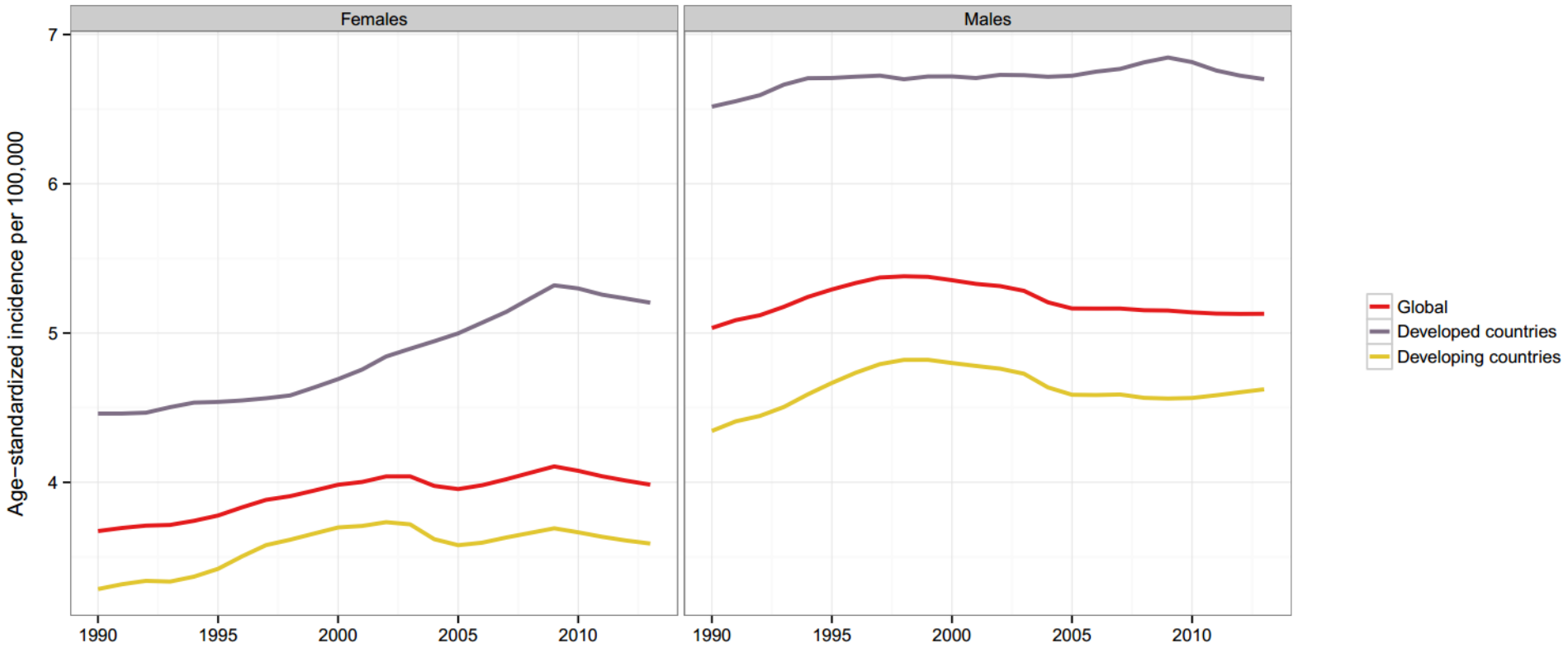
eFigure 8: Trends in age-standardized incidence rates for bladder cancer, females and males, global level, developed and developing countries, 1990-2013



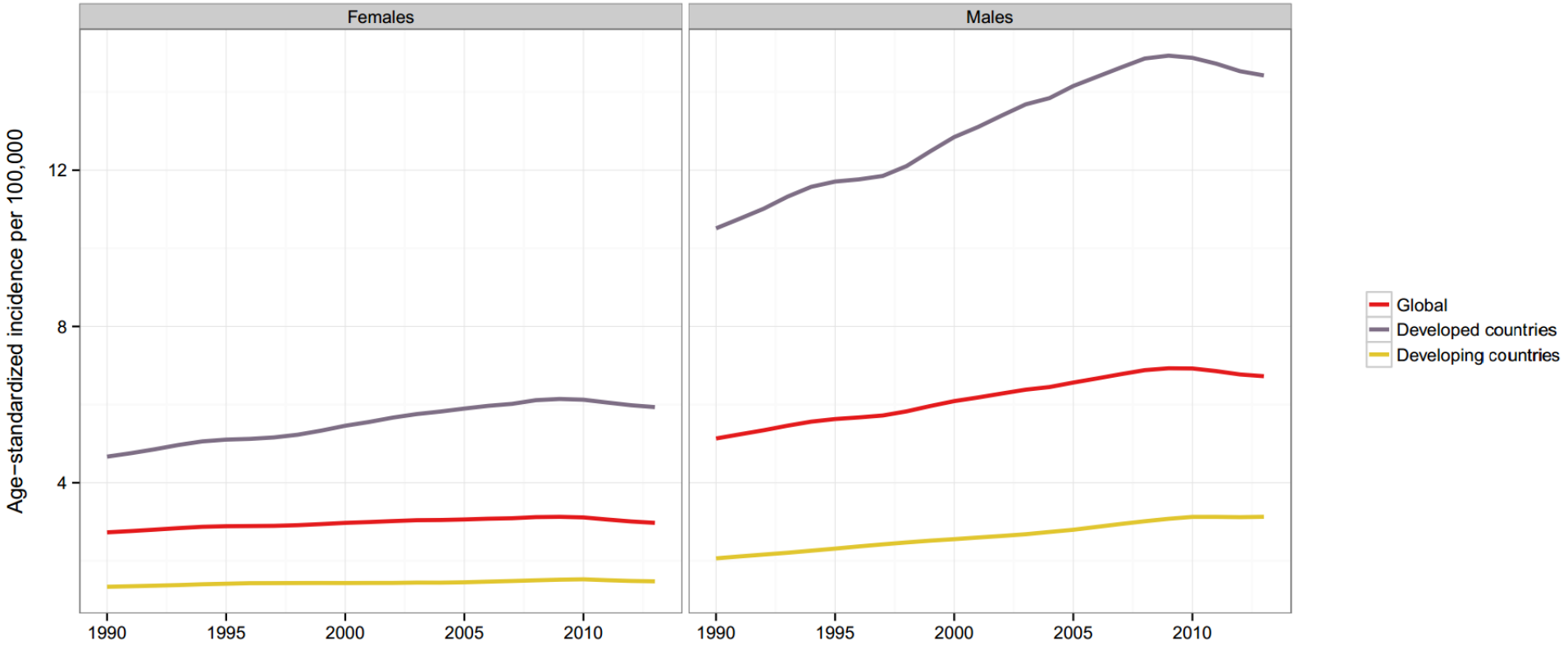
eFigure 9: Trends in age-standardized incidence rates for uterine cancer, females, global level, developed and developing countries, 1990-2013



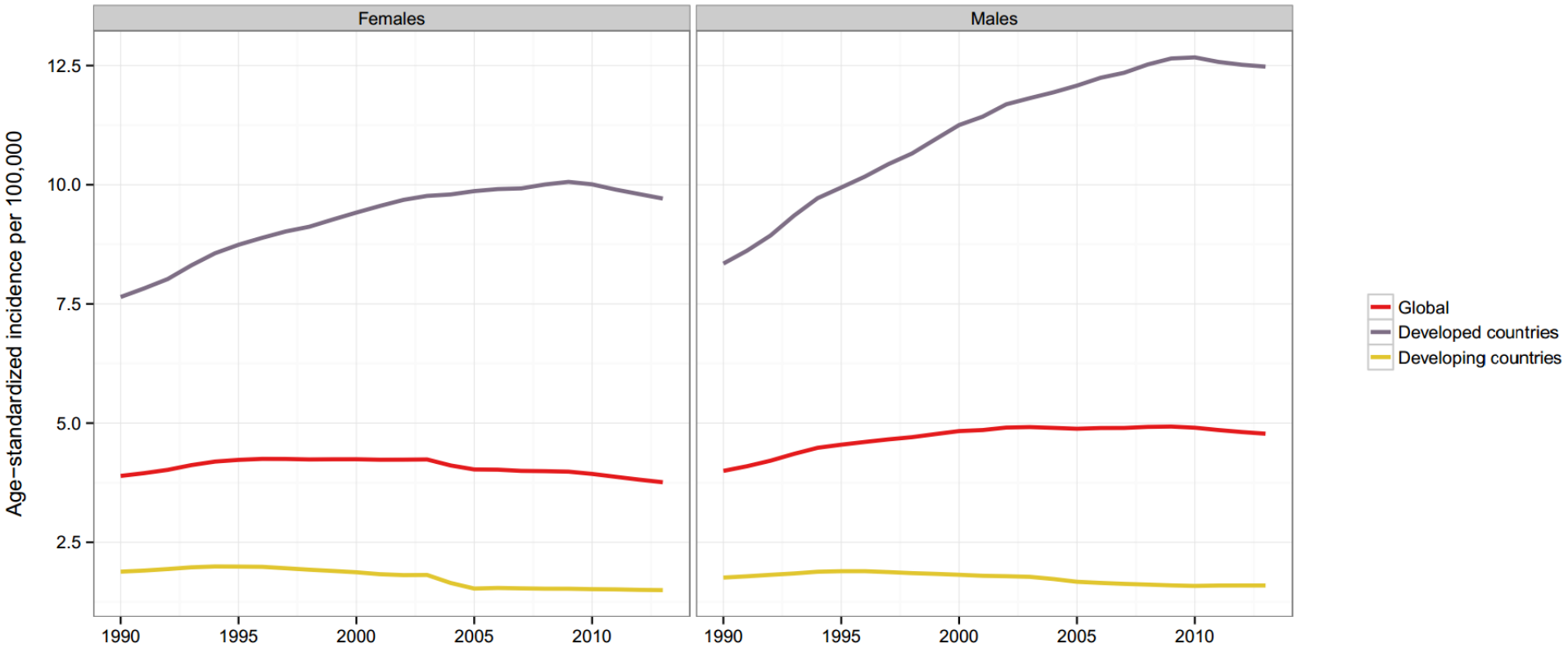
eFigure 10: Trends in age-standardized incidence rates for pancreatic cancer, females and males, global level, developed and developing countries, 1990-2013



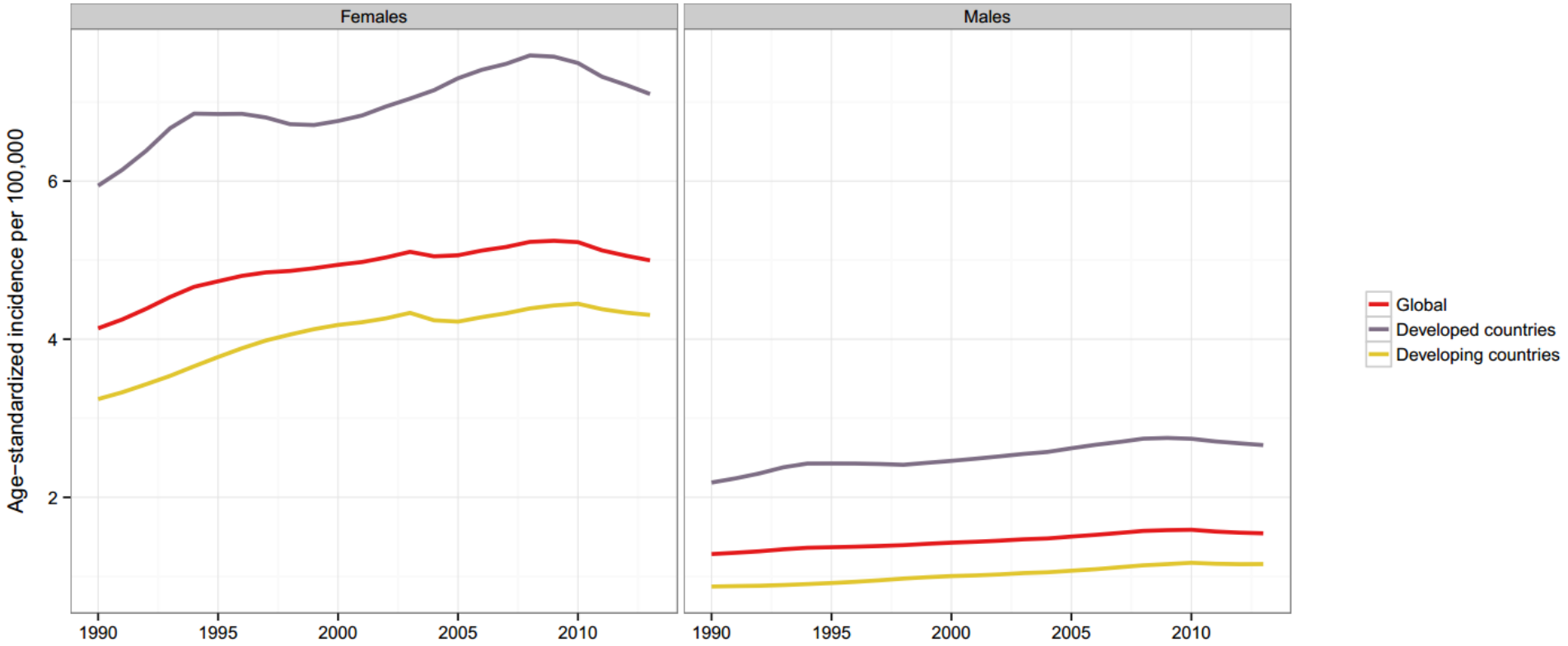
eFigure 11: Trends in age-standardized incidence rates for brain & nervous system cancer, females and males, global level, developed and developing countries, 1990-2013



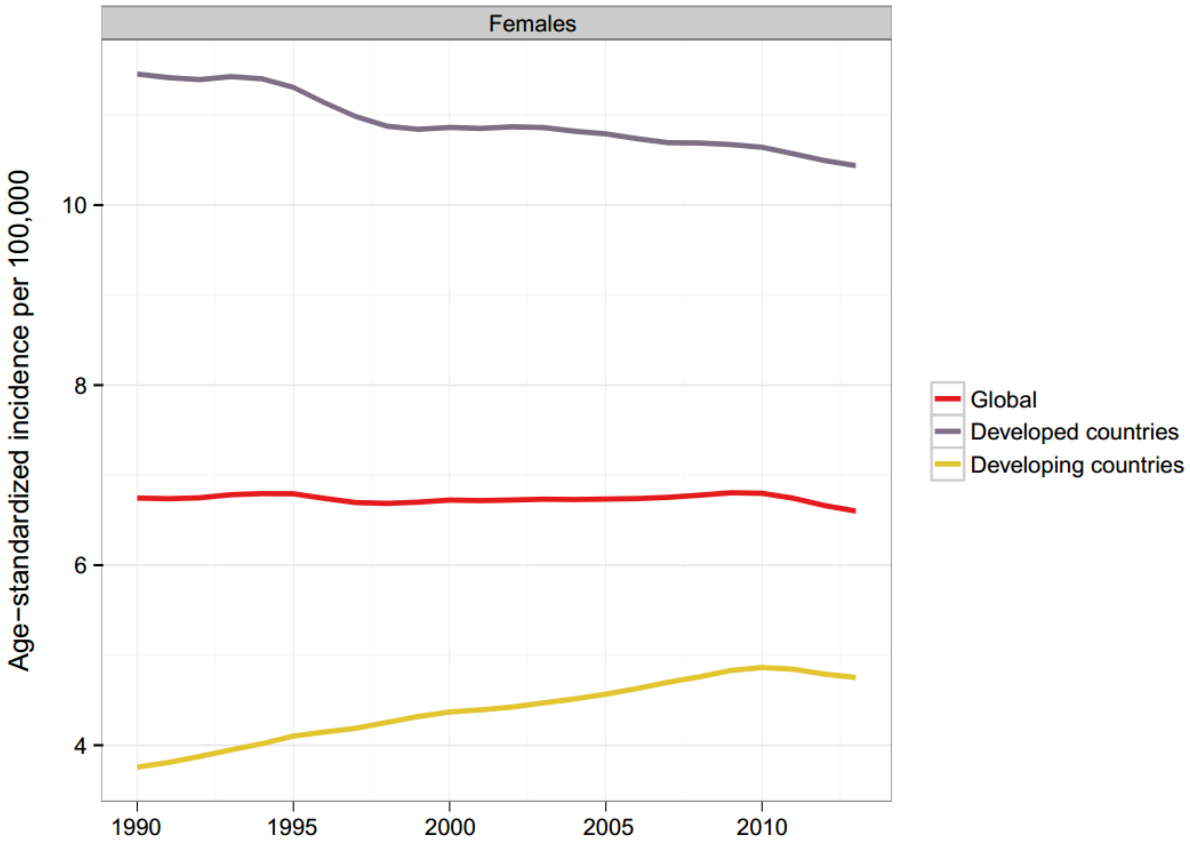
eFigure 12: Trends in age-standardized incidence rates for kidney cancer, females and males, global level, developed and developing countries, 1990-2013



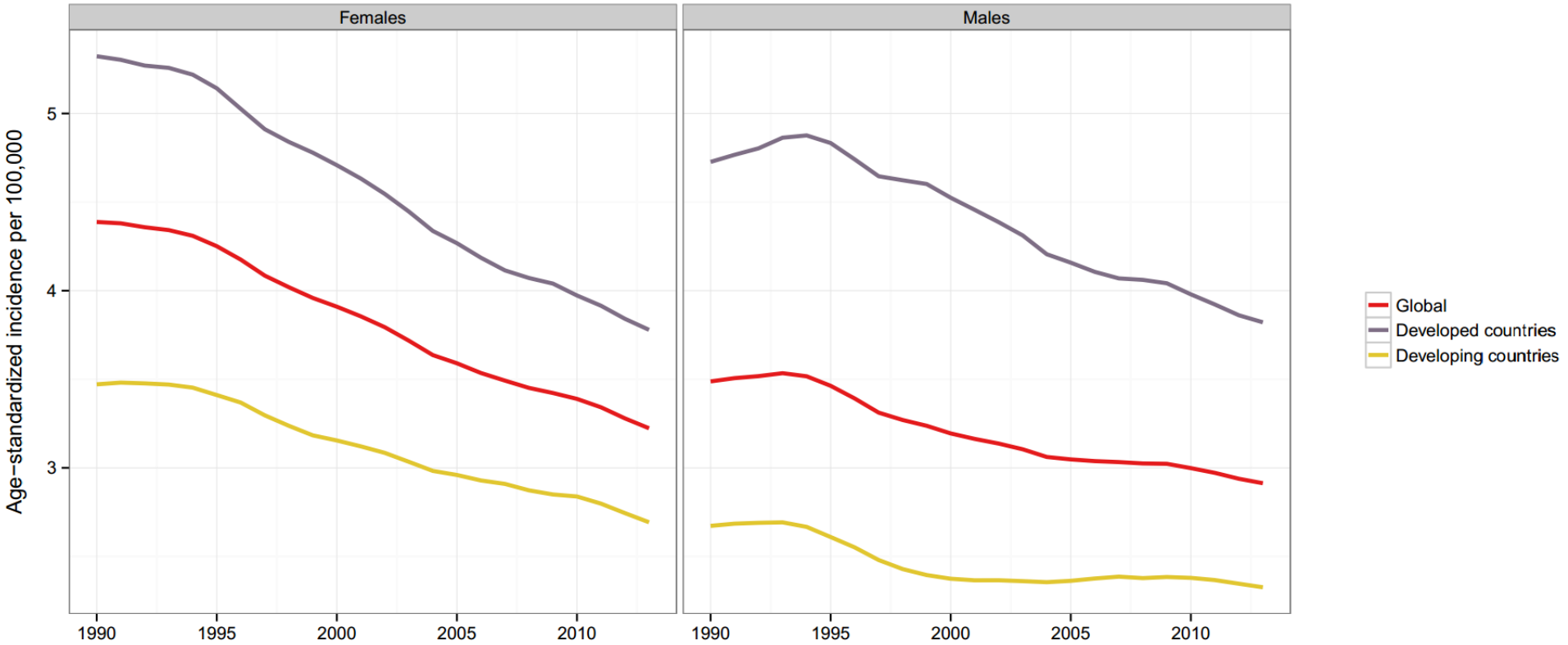
eFigure 13: Trends in age-standardized incidence rates for malignant skin melanoma, females and males, global level, developed and developing countries, 1990-2013



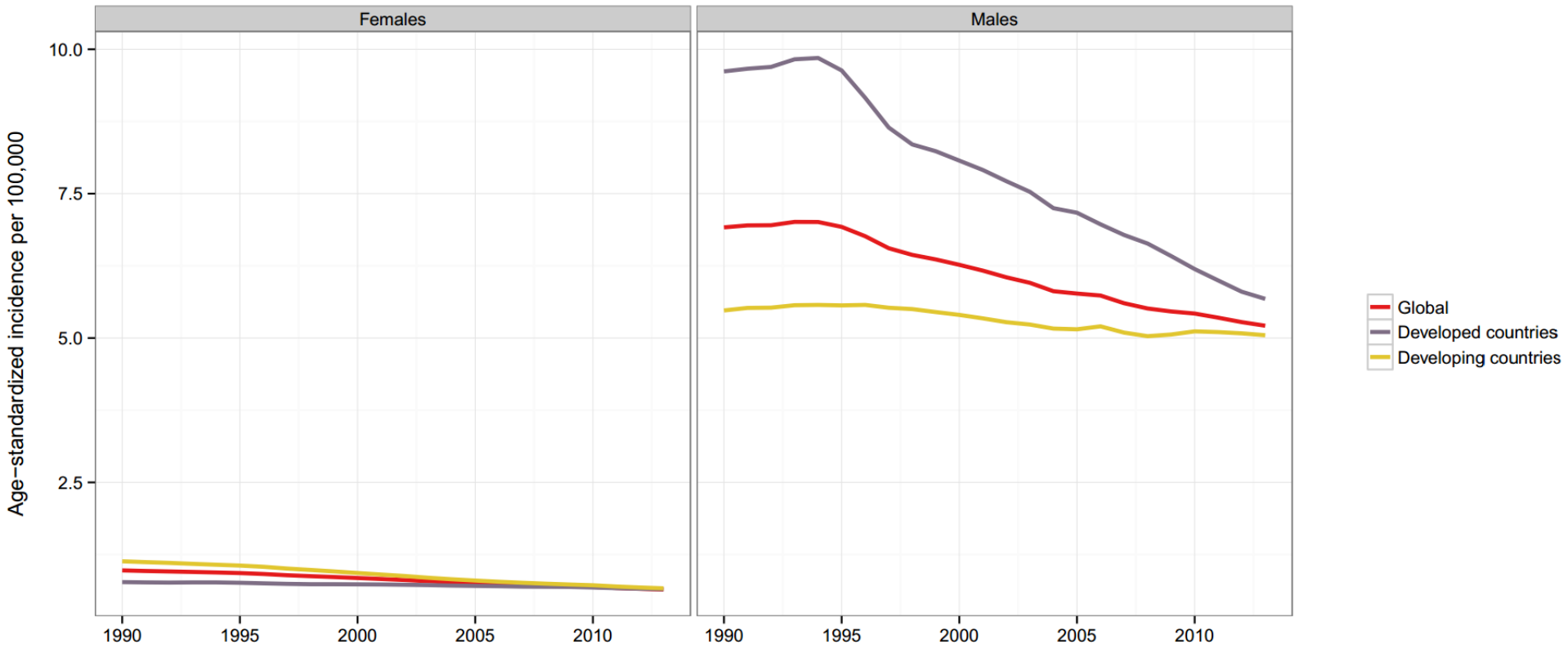
eFigure 14: Trends in age-standardized incidence rates for thyroid cancer, females and males, global level, developed and developing countries, 1990-2013



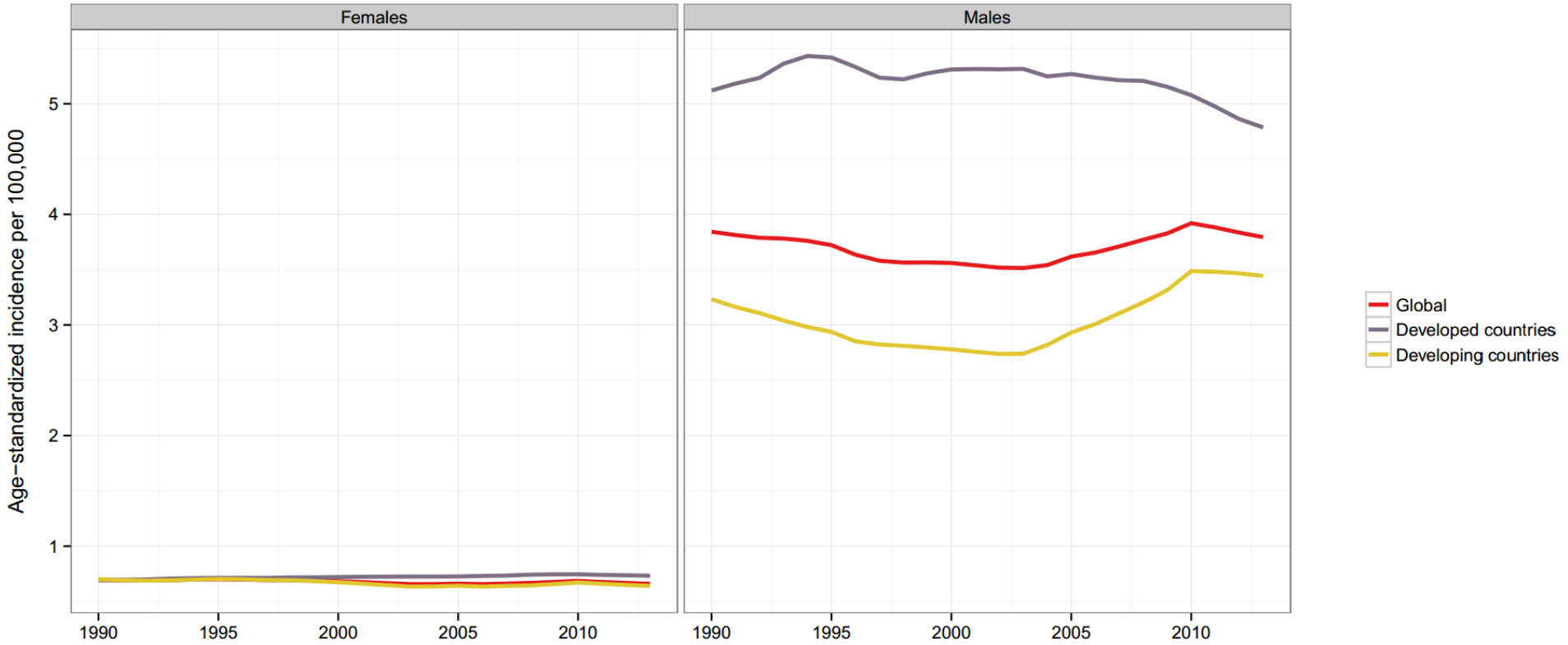
eFigure 15: Trends in age-standardized incidence rates for ovarian cancer, females, global level, developed and developing countries, 1990-2013



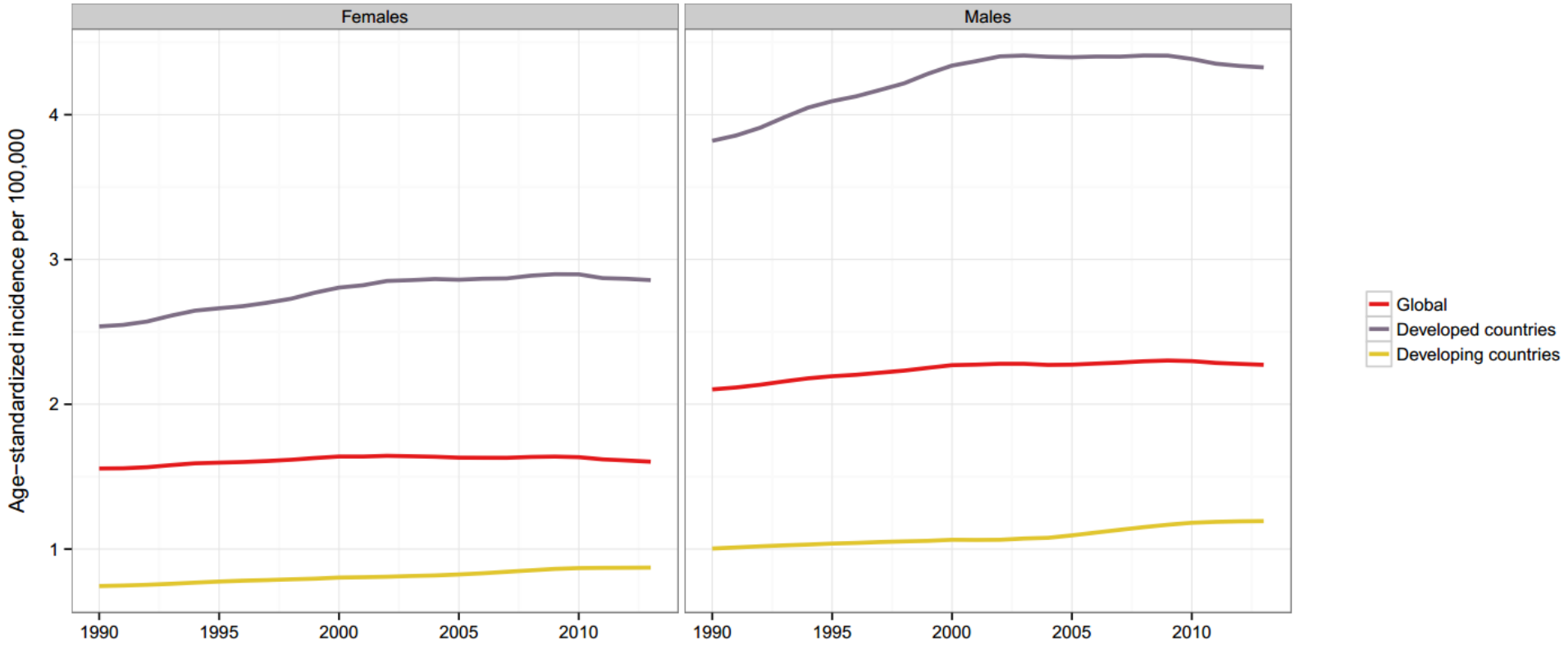
eFigure 16: Trends in age-standardized incidence rates for gallbladder cancer, females and males, global level, developed and developing countries, 1990-2013



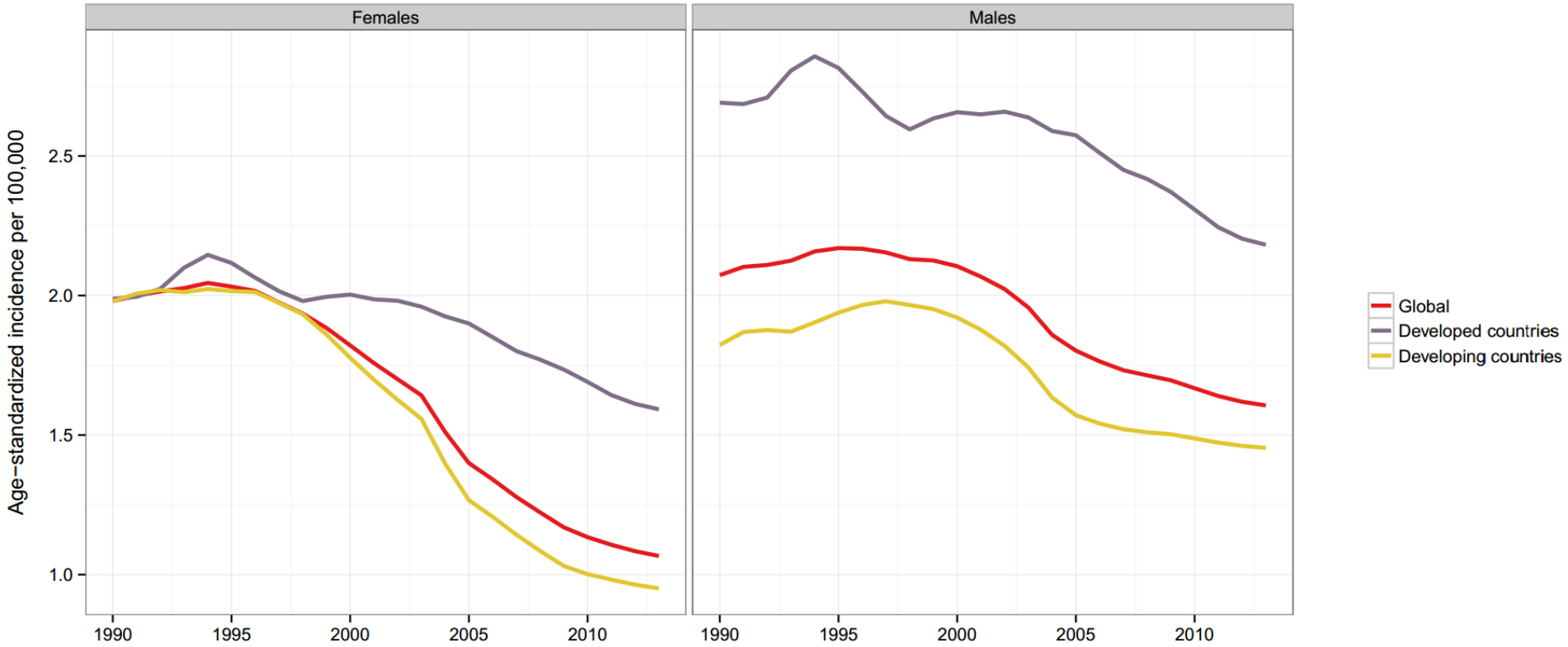
eFigure 17: Trends in age-standardized incidence rates for larynx cancer, females and males, global level, developed and developing countries, 1990-2013



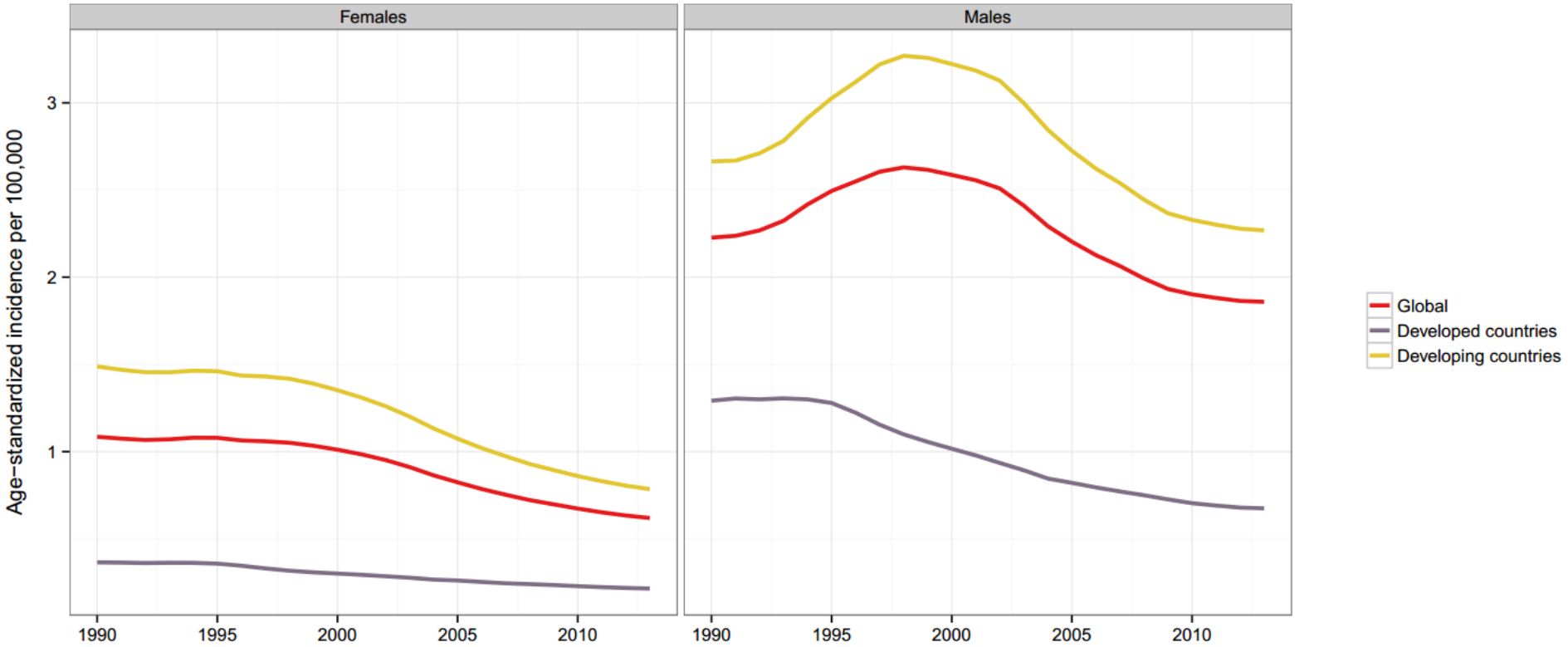
eFigure 18: Trends in age-standardized incidence rates for other pharynx cancer, females and males, global level, developed and developing countries, 1990-2013



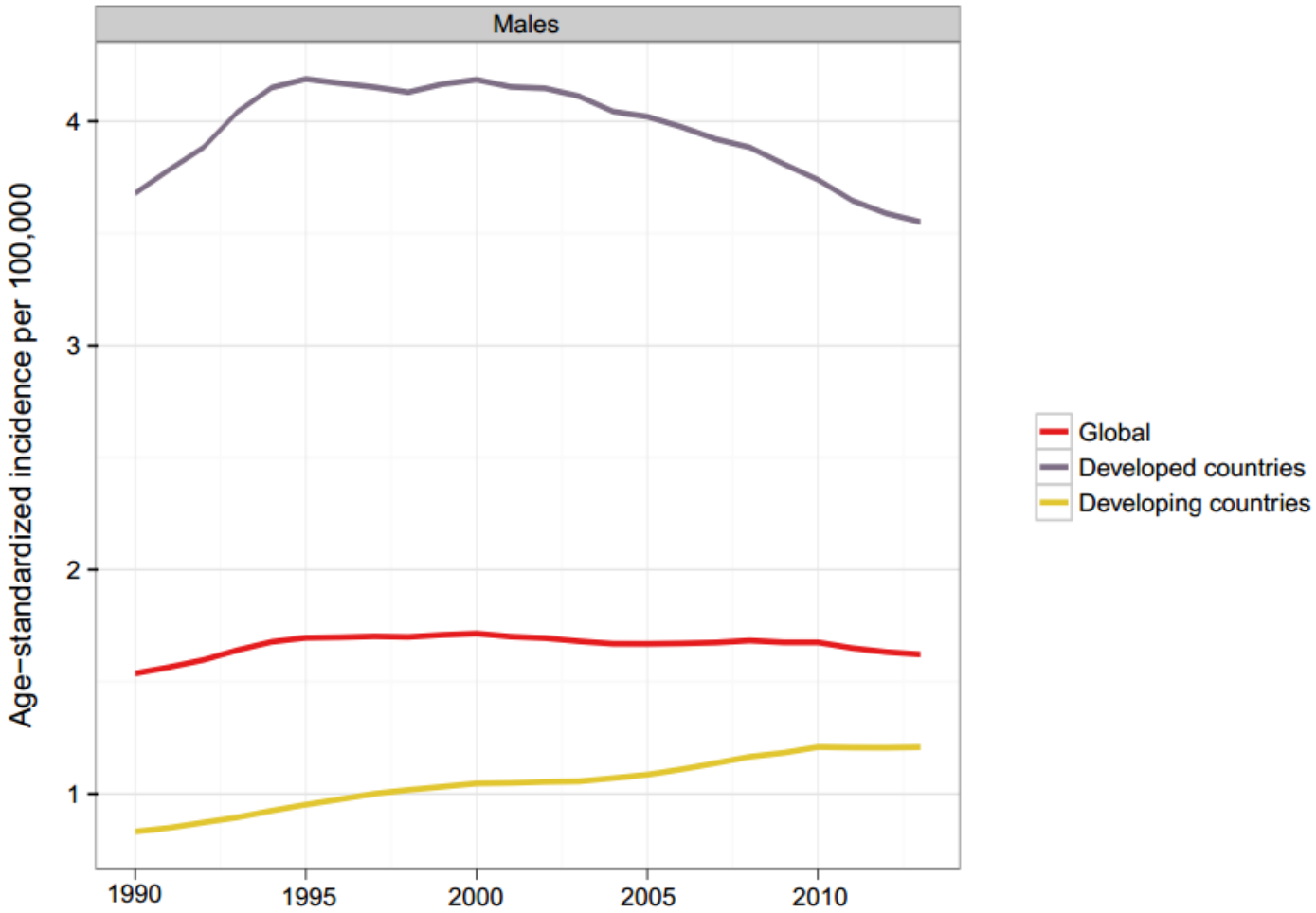
eFigure 19: Trends in age-standardized incidence rates for multiple myeloma, females and males, global level, developed and developing countries, 1990-2013



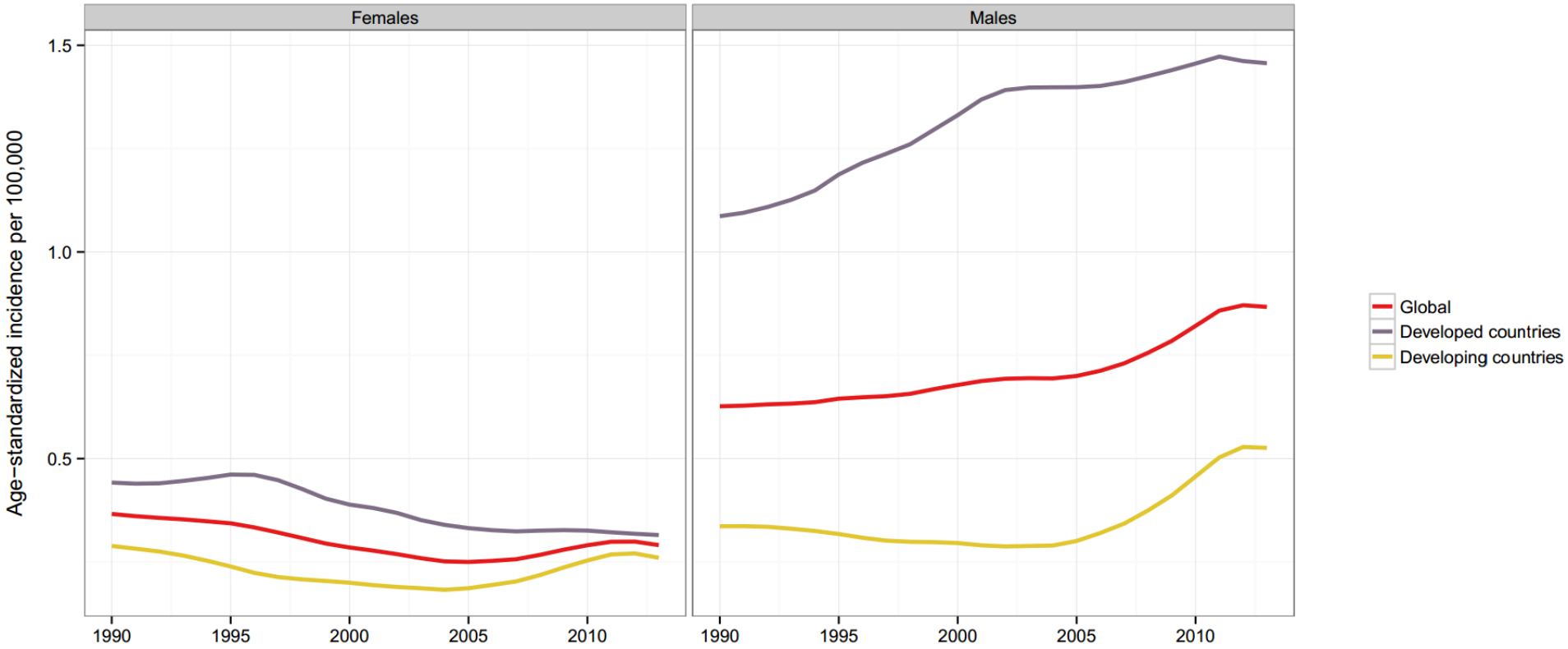
eFigure 20: Trends in age-standardized incidence rates for Hodgkin lymphoma, females and males, global level, developed and developing countries, 1990-2013



eFigure 21: Trends in age-standardized incidence rates for nasopharynx cancer, females and males, global level, developed and developing countries, 1990-2013



eFigure 22: Trends in age-standardized incidence rates for testicular cancer, males, global level, developed and developing countries, 1990-2013



eFigure 23: Trends in age-standardized incidence rates for mesothelioma, females and males, global level, developed and developing countries, 1990-2013

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